Original Research Article

SCROLL, SLEEP & STUDY: ASSESSMENT OF THE TRIANGULAR IMPACT OF SMARTPHONE ADDICTION ON UNDERGRADUATE MEDICAL STUDENTS IN A TERTIARY CARE CENTRE IN KANPUR, UTTAR PRADESH

Fazeelah Tasleem[1], Asma Aftab[2], Asra Saqib[3], Dibyajyoti Jena[4], Rahul Ray[4]

[1]Assistant Professor, Department of Community Medicine, Naraina Medical College, Panki, Kanpur, Uttar Pradesh, India
[2]Senior Resident, Department of Community Medicine, Hamdard Institute of Medical Sciences and Research, New Delhi, Delhi, India
[3]Assistant Professor, Department of Community Medicine, Dr. D.Y. Patil School of Medicine, Nerul, Navi Mumbai
[4]4th year MBBS Students, Naraina Medical College, Panki, Kanpur, Uttar Pradesh, India

A B S T R A C T

Background: Social media, defined as interactive, network-based platforms for user-generated content, has transformed how young people connect and learn. While it can support collaboration and access to information, excessive use disrupts attention, working memory, and self-regulation. The instant gratification from likes and notifications triggers dopamine release, reinforcing habitual use and diminishing motivation for academic tasks. The aim and objective are to estimate the prevalence of smartphone addiction among Undergraduate medical students , to find the association between smartphone use and sleep quality and to find the association between smartphone use and academic performance.

Materials and Methods: The cross-sectional study was conducted among 300 medical students from Naraina medical college, Kanpur. The online data was collected through a questionnaire consisting of four sections. The first section concerned the demographic characteristics of the participants with Pittsburgh sleep quality index (PQSI), Smartphone Addiction Scale Short Version (SAS-SV), and Academic Performance Scale.

Results: The prevalence of smartphone addiction is found out to be 57.44% in males and 65.17% in females. The sleep data show that 62.23% of males and 67.86% of females are getting poor-quality sleep. There is a positive correlation between overall PQSI scores and SAS-SV scores and Academic performance score.

Conclusion: This study illustrates the need for self-regulation of smartphone use among the medical undergraduates and the youth in general. It reveals not only the smartphone addiction of medical undergraduates, but also its impact on their academic performance and sleep quality. Empowering students to express emotions without bias would facilitate self-awareness and help-seeking behaviors. There should also be strong support for them. A change needs to be made in the academic curriculum regarding these issues to raise awareness. Classrooms should be designated as no smartphone zones to deal with the problem.

Keywords: Smartphone, addiction, sleep quality, academic performance.

INTRODUCTION

Smartphones have gradually grown in popularity since they were first made available to the general public in 1990. The International Telecommunication Union (ITU) reported that almost three- quarters of people over 10 years old worldwide own a mobile phone, according to their "Facts and Figures for 2022" report.[1,2]

While smartphones have improved connectivity among people and increased access to information, it has also lead to a rise in screen time, paving the way for addiction to online content, isolation and curtailed productivity [3] Studies show that extended smartphone use results in disturbed melatonin secretion and erratic sleep patterns due to blue light emissions. Consequently, the resultant fatigue makes it challenging for users to concentrate on their work, leading to procrastination, lowered cognitive performance and a fall in productivity. Social media and smartphone procrastination causes a decrease in productivity, along with limited time for studying, which leads to setbacks in achievement goals for students.[4]

According to the Government of India's telecom Statistics, the number of internet subscribers with smart phone access in India increased from 251.59 million in 2014 to 824.89 million in 2022.[5] While these statistics show rapid infrastructure development and technological progression, this also shows the trend of increased smartphone addiction in India, as most internet subscribers only use the internet on smartphones. Gambling addiction (behavioral addiction) has been categorized as a "substance- related and addictive disorder".[6] Smartphone addiction also shares several common characteristics with DSM-5 substance-related disorder criteria, including the four major factors: compulsive behavior, impairment of function, withdrawal and tolerance. Sleep quality serves as a crucial indicator of health. Research shows that smartphones hurt sleep quality.[7] A meta-analysis conducted in 2019 revealed that most studies show a prevalence of smartphone addiction, as measured by the SAS-SV questionnaire. The young adult population shows a median prevalence of 23.3%. The analysis shows a significant association between smartphone use and sleep quality, as well as related factors such as depression, anxiety, stress, and daily functional impairment.[8] Research has previously explored stress perception and its influence on sleeping patterns.[9] But no sufficient information is available regarding the changes in behavior and risk-taking behavior of medical students in India caused by irresponsible smartphone usage. This requires attention, especially with the available data suggesting that emotivity regulation is a risk factor for addiction.[10]

Some other studies have identified the pre-sleep usage of smartphones as a limitation for subjective sleep quality.[9] Students from various parts of the world show different types of internet usage, and these differences are prone to change as there is more digitalization. Thus, it becomes essential to study the relationship between smartphone usage and sleep pattern among medical graduates in different parts of the world.

Aims and Objectives

1. To estimate the Prevalence of smartphone addiction among Undergraduate Medical Students, Naraina Medical College,Panki, Kanpur.
2. To find the Association between Smartphone use and Sleep Quality
3. To find the Association between Smartphone use and Academic Performance.

MATERIALS AND METHODS

A cross-sectional study was conducted to assess the relationship between smartphone addiction, sleep quality and academic performance among undergraduate medical students. The study followed a structured approach, ensuring systematic data collection and analysis.

Study Design: The study employed a cross-sectional analytical design on undergraduate medical students.

Study Population and study area: The target population consisted of undergraduate medical students of Naraina Medical College,Kanpur from all academic years.

Study Period: 1st June 2025 to 31st November 2025. (6 months)

Inclusion and Exclusion Criteria:

Inclusion

Undergraduate medical students aged 18–30 years who own a smartphone and willing to participate.

Exclusion

Students who were unwilling to participate or did not own a smartphone

Sample Size: A total of 300 undergraduate medical students were included in the study. Participants were selected using a simple random sampling technique from the list of eligible students who consented to participate.

Data Collection Method: The following scales were used in the study.

Smartphone Addiction Scale (SAS-SV): A standardized questionnaire is used to measure smartphone addiction levels among participants. The SAS-SV is a self-reported validated scale that addresses the following five domains: (1) "daily-life disturbance," (2) "withdrawal," (3) "cyberspace-oriented relationship," (4) "overuse," and (5) "tolerance." For each item, opinions are expressed on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). A score of ≥31 means significant smartphone addiction.[11]

Pittsburgh Sleep Quality Index (PSQI): This validated tool assesses sleep quality and disturbances. A total of 9 individual items with 19 sub-sections generated seven "component" scores, including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month. The sum of scores for these seven components yields one global PSQI score. In each component, the scores varied from 0 to 3. Students who got a Pittsburgh sleep quality index (PSQI) global score of less than five are classified as having

"good sleep," and those who score equal to or more than five as ones having "poor sleep".[12]

Academic Performance Scale: This questionnaire is used to identify factors affecting students' academic performance. Eight questions are asked, and opinions are expressed on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Academic performance is categorized based on following score 33-40: Excellent Performance, 25-32: Good Performance, 17-24: Moderate Performance, 9-16: Poor Performance, 0-8: Failing Performance.

Data Collection Procedure: A semi-structured online questionnaire, was developed to collect data regarding demographic details, smartphone addiction, academic performance, and sleep quality among the participants. The questionnaire was administered using Google Forms, providing an accessible and convenient platform for data collection. Participants who voluntarily agreed to participate completed the online questionnaire anonymously through the Google Forms platform.

An invitation containing the purpose and details of the study, along with the link to the Google Form questionnaire, was sent to all eligible medical students.

Data Analysis: The collected data was entered into MS Excel and then imported to jamovi(2.4.8) for analysis. Descriptive statistics, such as mean, standard deviation, and frequency distribution, were used to summaries the data. Inferential statistical tests such as Chi-square and multiple regression analysis were applied to determine the association between smartphone addiction and its impact on sleep and academic performance. A p- value of <0.05 was considered statistically significant.

Ethical Consideration: Ethical clearance was obtained from the Institutional Ethics Committee before commencement of the study. Written informed consent was obtained from all participants. Privacy and confidentiality were strictly maintained.

RESULTS

The study included a total of 300 participants,the majority of participants (48.3%) were in the 22–24 years age group,188 (62.7%) were males and 112 (37.3%) were females [Table 1].

Table 1: Demographic Characterstics of Study Participants (N=300)

Variable	Category	Number	Percentage (%)
Age	18-20	8	2.7
	20-22	43	17
	22-24	145	48.3
	24-26	71	23.7
	26-28	27	9
	28-30	6	2
Total		300	100%
Gender	Male	188	62.7
	Female	112	37.3
	Total	300	100%

Table 2: Distribution of Research Variables among Study Participants (N=300)

Variable	Category	Gender	Number	Percentage
Sleep Quality	Good Sleep	Male	46	15.3
		Female	25	8.3
	Bad Sleep	Male	142	47.3
		Female	87	29
Total			300	100%
Academic Performance	Excellent	Male	40	13.3
		Female	18	6
	Good	Male	101	33.7
		Female	65	21.7
	Moderate	Male	40	13.3
		Female	27	9
	Poor	Male	7	2.3
		Female	2	0.7
	Total		300	100%
Smartphone Addiction	Addicted	Male	108	36
		Female	73	24.3
	Not Addicted	Male	80	26.7
		Female	39	13
Total			300	100%

Out of 300 participants, 76.3% (47.3% males + 29.0% females) reported poor sleep quality, while only 23.6% (15.3% males + 8.3% females) had good sleep. Thus, the majority of students suffer from bad sleep, indicating possible stress, academic load, or lifestyle-related factors.

The majority of participants reported good (55.4%) or moderate (22.3%) academic performance. Only 19.3% showed excellent performance, while poor performance was least common (3.0%). Overall, males performed slightly better academically than females in this study. Addiction to smartphones was

noted in 60.3% of participants (36.0% males + 24.3% females). There is a high rate of smartphone dependency among students, particularly males. [Table 2]

Table 3: Association Between Smartphone Addiction and Academic Performance (N=300)

Variable	category	Academic performance				Chi square	P value
		Poor	Moderate	Good	Excellent		
Smart phone addiction	Not addicted	5	22	68	24	2.44	0.486
	Addicted	4	45	98	34		
Total		9	67	166	58		

Students with smartphone addiction seems slightly more in number in each category, although this variation is not large enough to be statistically meaningful (Chi-square test value 2.44 with a p-value of 0.486) [Table 3]

Table 4: Association between Smart phone Addiction and Sleep Quality (N=300)

Variable	Category	Sleep Quality		Chi Square	P value
		Good Sleep	Poor Sleep		
Smart phone addiction	Not Addicted	40	79	10.8	*0.001
	Addicted	31	150		
Total		71	229		

*p value <0.05 is significant.

There is a significant association between smartphone addiction and sleep quality among the participants. Students who were addicted to smartphones had a higher prevalence of poor sleep (150 out of 181; 82.9%) compared to those who were not addicted (79 out of 119; 66.4%).Therefore, smartphone addiction negatively affects sleep quality, suggesting that increased smartphone use may contribute to sleep disturbances [Table 4]

Table 5: Association between Academic Performance and Sleep Quality(N=300)

Variable	Category	Sleep Quality		Chi Square	P value
		Good	Poor		
Academic Performance	Poor	5	4	18.3	*<0.001
	Moderate	7	60		
	Good	37	129		
	Excellent	22	36		
Total		71	229		

*p value <0.05 is significant

Sleep quality has a significant effect on academic performance. Students who reported good sleep were more likely to have good or excellent academic performance, whereas those with poor sleep were more often in the moderate or poor performance categories. Chi-square value is 18.3 with a p-value < 0.001, indicates a highly significant association between academic performance and sleep quality [Table 5].

Table 6: Correlation Of Smartphone Addiction with Academic Performance and Sleep Quality (n=300)

Variable	Pearson correlation value (r)	P value
Academic performance	-0.121	0.036
Sleep Quality	0.348	<0.001

The correlation coefficient (r = -0.121, p = 0.036) indicates a weak but statistically significant negative correlation. This means that as the smartphone use increases, academic performance tends to decrease.
The correlation coefficient (r = 0.348, p < 0.001) indicates a moderate and highly significant positive correlation. This means that with lower smartphone addiction or healthier habits, sleep quality tends to improve [Table 6]
P value <0.05 is statistically significant
R value (0.9 to 1.0) =very highly correlated
(0.7 to 0.9) = highly correlated
(0.5 to 0.7) = moderately correlated
(0.3 to 0.5) = low correlation (-)=negative correlation.

DISCUSSION

The present study aimed to assess the relationship between smartphone addiction, sleep quality, and academic performance among undergraduate medical students. A total of 300 participants were included, with a majority in the 22–24 year age group and a male predominance (62.7%). This study shows that 76.3% (47.3% males + 29.0% females) are having poor sleep quality, while only 23.6% (15.3% males + 8.3% females) were having good sleep, significant association between smartphone addiction and sleep quality among the participants (p value =0.001) similarly in a study by (Chatterjee and et al

2021),[3] 63.39% reported as poor sleepers as assessed by their PQSI scores.[11,12]

Addiction to smartphones was noted in 60.3%of participants (36.0% males + 24.3% females) in this study, on the other hand (46.15%) were screened positive for smartphone addiction as per the SAS-SV scores, including (45.45%) females (47.87%) males in a study by Dharmadhikari et al.[9]

There is a significant association between Academic Performance and Sleep Quality (p value <0.001), students who reported good sleep were more likely to have good or excellent academic performance, whereas those with poor sleep were more often in the moderate or poor performance, similarly in a study by Siddharthan A et al,[13] the significant impact that social media use has on medical students' sleep patterns, shows that excessive use can lead to addiction and affect sleep quality. This has a significant impact on students' mental and physical health, as poor sleep quality can affect academic performance and overall well-being.

CONCLUSION

The study concludes that smartphone addiction adversely affects sleep quality, and poor sleep, in turn, impacts academic performance. A high prevalence of poor sleep quality among students was noted , with a significant association between smartphone addiction and sleep quality (p = 0.001). Students who were addicted to smartphones were more likely to experience poor sleep compared to those who were not addicted.Although smartphone addiction was not significantly related to academic performance (p = 0.486), a strong association was observed between sleep quality and academic performance (p < 0.001).Students with good sleep quality demonstrated better academic performance, indicating that adequate and restful sleep plays a vital role in maintaining concentration, memory, and learning efficiency.

Recommendations:

1. Encourage digital detox practices, such as limiting screen time especially before bedtime.
2. Establish student counseling services focusing on stress management, time management, and digital balance.
3. Faculty and mentors should guide students in maintaining a healthy balance between academic workload and leisure activities.
4. Institutions can consider digital-wellness policies, such as limited phone use during college hours.

REFERENCES

1. Alfa AI. Scrolling vs studying: Social media use and its psychological implication on learning among secondary school students in Nigeria. Aminu Kano Academic Scholars Association Multidisciplinary Journal. 2025 Oct 7;2(1):261–81.
2. Sadiq S, Anasse K, Slimani N. Scrolling through sleep: Moroccan high school students smartphone uses and sleep quality. ijirss. 2023 Jun 13;6(3):702–9.
3. Chatterjee S, Kar SK. Smartphone Addiction and Quality of Sleep among Indian Medical Students. Psychiatry. 2021 Apr 3;84(2):182–91.
4. Chen G, Lyu C. The relationship between smartphone addiction and procrastination among students: A systematic review and meta-analysis. Personality and Individual Differences. 2024 Jul 1;224:112652.
5. Department of Telecommunication | https://dot.gov.in/node [Internet]. [cited 2025 Oct 16]. Available from: https://dot.gov.in/
6. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders [Internet]. Fifth Edition. American Psychiatric Association; 2013 [cited 2025 Oct 16]. Available from: https://psychiatryonline.org/doi/book/10.1176/appi.books.97 80890425596
7. Christensen MA, Bettencourt L, Kaye L, Moturu ST, Nguyen KT, Olgin JE, et al. Direct Measurements of Smartphone Screen-Time: Relationships with Demographics and Sleep. PLoS One. 2016;11(11):e0165331.
8. Sohn S, Rees P, Wildridge B, Kalk NJ, Carter B. Prevalence of problematic smartphone usage and associated mental health outcomes amongst children and young people: a systematic review, meta-analysis and GRADE of the evidence. BMC Psychiatry. 2019 Nov 29;19:356.
9. Dharmadhikari SP, Harshe SD, Bhide PP. Prevalence and Correlates of Excessive Smartphone Use among Medical Students: A Cross-sectional Study. Indian J Psychol Med. 2019 Nov 11;41(6):549–55.
10. Estévez A, Jáuregui P, Sánchez-Marcos I, López-González H, Griffiths MD. Attachment and emotion regulation in substance addictions and behavioral addictions. J Behav Addict. 6(4):534–44.
11. The Smartphone Addiction Scale: Development and Validation of a Short Version for Adolescents | PLOS One [Internet]. [cited 2025 Oct 16]. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.p one.0083558
12. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989 May;28(2):193–213.
13. A S, Aljin V, Hariharan S, Eashwar VA. Social Media Addiction and its Association with Sleep Quality Among Medical Students in A Medical College In Tamil Nadu, India. National Journal of Community Medicine. 2024 Sep 1;15(09):712–9.