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Original Article

Effect of mobile phone use on academic performance of undergraduate medical students

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ABSTRACT

Objective*: To determine the correlation of 'Mobile Phone Problematic Use' score with academic performance score of undergraduate medical students.*

Methods*: The study was conducted at Nishtar Medical College as a cross-sectional study over six months after the approval of the synopsis. Participants completed the Mobile Phone Problematic Use Scale (MPPUS-10) and the Academic Performance Questionnaire, ensuring all items were answered. The MPPUS-10 consisted of 10 items across five dimensions (craving, negative life consequences, peer acceptance, withdrawal, and loss of control), scored on a 5-point Likert scale, with total scores calculated by summing all items.*

Results*: Out of the 250 students, 68.4% were classified as smartphone-addicted, and 31.6% were non-addicted. The average academic score of smartphone-addicted students 60.42 ± 4.06 was significantly lower than that of non-addicted students 68.77 ± 5.69. Among the 171 smartphone-addicted students, 39.2% played games, 53.6% used social media, 41.2% used smartphones for entertainment, and 62.4% used smartphones before sleeping. The average daily smartphone usage duration was 4.92 ± 1.84 hours.*

Conclusion: *Smartphone addiction significantly harms medical students' academic performance, potentially reducing their future professional competence and healthcare quality, but can be mitigated by promoting smarter smartphone use and co-curricular activities.*

Keywords*: Smart phone, Acedemic performance, Medical students, Undergraduate, Addiction.*

1. INTRODUCTION

We are currently dwelling in a technological revolution in which the electronic device, most prominently the smartphone, is among the most convenient gadgets to use for daily living. Because of this, smartphones are easily used, cheap, and highly sophisticated, and, therefore, highly used by people across the globe. The internet revolution is also because of the ease of accessing the internet from a smartphone. In 2024, an estimated 4.9 billion people around the world will have used smartphones. This is likely to rise to 6.4 billion in 2029. With such widespread adoption, smartphones have become deeply integrated into daily activities, including education, communication, and entertainment. However, their pervasive use raises concerns about their impact on academic performance, particularly among students in demanding fields such as medicine.

Several studies have explored the effects of mobile phone use on learning outcomes, but findings remain inconsistent. Some research suggests that smartphones enhance learning by facilitating access to online textbooks, medical apps, and collaborative study platforms. Conversely, other studies indicate that frequent phone use leads to decreased concentration, poor time management, and lower grades. Among medical students, who face intense academic pressure, the negative effects of smartphone addiction—such as reduced sleep quality and increased procrastination—may outweigh the advantages. This study aims to provide clearer insights into how mobile phone usage influences the academic performance of undergraduate medical students.

The academic performance of medical students is critical, as it directly impacts their future competence as healthcare professionals. Given the rigorous nature of medical education, any factor that hinders learning must be carefully examined. Excessive smartphone use may contribute to cognitive overload, reduced retention of information, and diminished problem-solving skills—all of which are essential for medical training. By assessing the extent to which mobile phone usage affects study habits, exam scores, and overall academic success, this research will help educators and students make informed decisions about technology use in medical education.

Ultimately, this study seeks to determine whether smartphones serve as a useful educational tool or a disruptive influence on medical students' academic performance. By analyzing usage patterns, study behaviors, and academic outcomes, the findings will contribute to the ongoing discussion on balancing technology in education. The results may also guide institutions in implementing policies that promote productive smartphone use while mitigating distractions. As smartphones continue to evolve, understanding their impact on medical education is essential for fostering a generation of well-prepared and focused healthcare professionals.

2. METHODOLOGY

The study was conducted at Nishtar Medical College as a cross-sectional study over six months after the approval of the synopsis. The sample size

was calculated using PASS 11 with a one-sample correlation formula, assuming a correlation of 0.7 between the Mobile Phone Problematic Use Scale (MPPUS) and academic performance scores, an alternate correlation of 0.70, a power of 90%, and a significance level of 5%, resulting in a sample size of 250 participants. Simple random sampling using the draws method was employed, with 50 students selected from each MBBS year.

The study included undergraduate MBBS students aged 16–29 years, both male and female, while excluding medical students without mobile phones or those unwilling to participate. Ethical approval was obtained from the Institutional Ethical Review Board before data collection. Informed consent was taken from all participants, and baseline demographic data, including age, gender, residence (rural/urban), year of study, type of mobile phone (Android, iPhone, others), and duration of mobile phone use on working days and weekends, were recorded.

Participants completed the Mobile Phone Problematic Use Scale (MPPUS-10) and the Academic Performance Questionnaire, ensuring all items were answered. The MPPUS-10 consisted of 10 items across five dimensions (craving, negative life consequences, peer acceptance, withdrawal, and loss of control), scored on a 5-point Likert scale, with total scores calculated by summing all items. The Academic Performance Questionnaire included five items, also scored on a 5-point Likert scale, with total scores derived similarly. The findings provided insights into the association between problematic mobile phone use and academic performance among medical students.

Data were analyzed using SPSS version 23, with continuous variables presented as mean ± standard deviation and categorical variables as frequencies and percentages. Pearson correlation was used to assess the relationship between mobile phone problematic use and academic performance, with a p-value ≤ 0.05 considered significant. Stratified analysis was performed based on age, gender, residence, year of study, and type of mobile phone to examine variations in the correlation.

3. RESULTS

A total of 250 students, with a mean age of 23.74 ± 3.52 years, participated in the study, consisting of 161 males (64.4%) and 89 females (35.6%). The majority of participants were fourth-year medical students (86, 34.4%), while 175 (70.0%) were day scholars and 75 (30.0%) lived in hostels (Table I).

Among the 171 smartphone-addicted students, 98 (39.2%) played games, 134 (53.6%) used social media, 103 (41.2%) used smartphones for entertainment, and 156 (62.4%) used smartphones before sleeping. The average daily smartphone usage duration was 4.92 ± 1.84 hours (Table III).

Table I: Demographic Characteristics of the Students (N=250)

Characteristic	N (%)	Mean ± S.D
Age (years)		23.74 ± 3.52
Gender		
- Male	161 (64.4%)	
- Female	89 (35.6%)	
Class		
- 1st year	10 (4.0%)	
- 2nd year	34 (13.6%)	
- 3rd year	84 (33.6%)	
- 4th year	86 (34.4%)	
- 5th year	36 (14.4%)	
Place of Stay		
- Day scholar	175 (70.0%)	
- Hostel	75 (30.0%)	

Out of the 250 students, 171 (68.4%) were classified as smartphone-addicted, and 79 (31.6%) were non-addicted (Figure I). The average academic score of smartphone-addicted students (60.42 ± 4.06) was significantly lower than that of non-addicted students (68.77 ± 5.69), with this difference being statistically significant (t = -13.08, df = 248, p < 0.001) (Table II).

Figure I: Smartphone Addiction Among Students

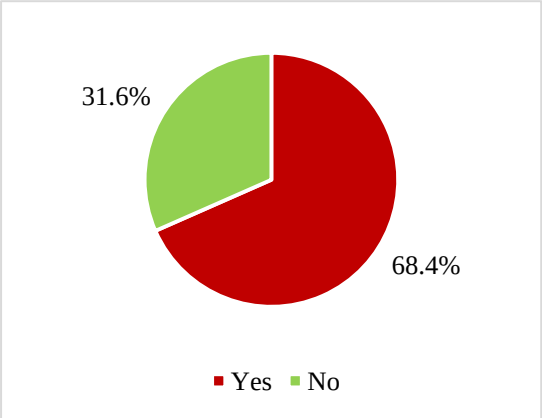

Table II: Comparison of Academic Scores with Smartphone Addiction

Academic Scores	Smartphone Addiction	Test of Significance
	Yes (N=171)	**No (N=79)**
Mean ± S.D	60.42 ± 4.06	68.77 ± 5.69
t = -13.08, df = 248, p < 0.001		

Table III: Smartphone Usage among Addicted Students (N=171)

Usage	N (%)	Mean ± S.D
Gaming	98 (39.2%)	
Social media	134 (53.6%)	
Entertainment (Movies, etc.)	103 (41.2%)	
Before sleeping	156 (62.4%)	
Smartphone usage duration (hours/day)		**4.92 ± 1.84**

4. DISCUSSION

The mean age of participants **(**23.74 years**)** is consistent with studies conducted among medical students, such as Al-Dabal et al[11], who reported a similar mean age of 23.5 years in a Saudi Arabian cohort. However, our study had a higher proportion of male students **(**64.4%**)** compared to studies by Dyrbye et al[12], where gender distribution was nearly equal (51% female, 49% male). This discrepancy may reflect regional variations in medical school enrollment, as male dominance in medical education has been reported in certain Asian and Middle Eastern countries.

Our study found that 34.4% of participants were fourth-year students**,** which contrasts with findings by Yusoff et al[13], where clinical-year students (Years 4–5) constituted only 25% of their sample. The higher proportion of senior students in our study may be due to differences in curriculum structure or sampling methods.

A significant proportion of participants **(**70%) were day scholars**,** while 30% lived in hostels. This differs from a study by Sreeramareddy et al[14], where over 50% of medical students resided in university hostels. The variation may be attributed to institutional policies or socioeconomic factors influencing students' living arrangements.

The present study found a high prevalence of smartphone addiction among students, with 68.4% (n=171) classified as addicted. The mean academic score of smartphone-addicted students (60.42 ± 4.06) was significantly lower than that of non-addicted students (68.77 ± 5.69), reinforcing the association between smartphone overuse and poorer academic outcomes.

Our findings are consistent with multiple studies demonstrating the adverse effects of smartphone addiction on

academic performance. A study by Samaha et al[15] reported that students with higher smartphone addiction tendencies had significantly lower GPAs, suggesting that excessive use detracts from study time and cognitive focus. Similarly, Lepp et al[16] found that frequent smartphone use was negatively correlated with academic achievement, as it contributes to increased distractions and reduced study engagement.

Moreover, Chen et al[17] observed that smartphone addiction was associated with poor sleep quality and decreased concentration, further exacerbating academic difficulties. Our results support these findings, as addicted students exhibited notably lower academic scores, likely due to similar mechanisms of distraction and cognitive overload.

The high prevalence of gaming (39.2%) and social media use (53.6%) among addicted students is consistent with findings by Lin et al[18], who reported that excessive smartphone use is strongly linked to social networking and gaming, contributing to addictive behaviors. Similarly, Jeong et al[19] found that adolescents who frequently engaged in social media and gaming were at a higher risk of smartphone addiction due to the instant gratification and reinforcement mechanisms these platforms provide. The average daily usage of 4.92 hours is comparable to findings by Lopez-Fernandez et al[20], who reported that individuals with smartphone addiction averaged 4–5 hours of daily use, leading to impaired daily functioning.

5. CONCLUSION

Smartphone addiction significantly harms medical students' academic performance, potentially reducing their future professional competence and healthcare quality, but can be mitigated by promoting smarter smartphone use and co-curricular activities.

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