

IMPACT OF SMARTPHONE USAGE ON SLEEP QUALITY AND ACADEMIC PERFORMANCE AMONG BSC NURSING STUDENTS IN PAKISTAN

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ABSTRACT

The integration of smartphones into the daily lives of university students has raised concerns regarding their impact on health and education. Nursing students, who face rigorous academic and clinical demands, are particularly vulnerable to the consequences of excessive device usage. This study explored the relationship between smartphone addiction, sleep quality, and academic outcomes within the specific context of nursing education in Pakistan. A quantitative descriptive correlational design was employed. Data were collected via non-probability convenience sampling from 31 BSc Nursing students in Karachi using a structured questionnaire. The instrument included the Pittsburgh Sleep Quality Index (PSQI) and self-reported academic performance (GPA). Data were analyzed using descriptive statistics and Pearson correlation analysis. The findings indicated moderate levels of smartphone addiction ($M=3.29$, $SD=0.86$) and below-average sleep quality ($M=2.87$). Correlation analysis revealed a significant moderate negative relationship between smartphone addiction and sleep quality ($r = -0.42$) and a negative correlation with academic performance ($r = -0.36$). Conversely, better sleep quality was positively associated with higher academic achievement ($r = 0.44$). Furthermore, smartphone addiction was linked to increased daytime tiredness ($r = 0.48$), which further impaired academic efficiency. Smartphone usage significantly disrupts sleep patterns and negatively impacts the academic success of BSc Nursing students. The findings suggest that sleep quality acts as a critical mediator between technology habits and educational outcomes. It is recommended that nursing institutions implement awareness programs and "digital discipline" workshops to help students balance technology use with their health and professional training requirements.

Keywords: Smartphone Addiction, Sleep Quality, Academic Performance, BSc Nursing, Pakistan, PSQI, Daytime Tiredness.

INTRODUCTION

Technological innovations have made smartphones and internet more accessible and have increased the use by students especially in the

health-related fields like nursing. Cell phones have become essential ways to communicate, get an education and access information, but their

possible effects on health and academic performance are worrying. Studies on students of health-related disciplines (notably nursing and medical students) suggest that dependency on smartphones affects the physical and psychological wellbeing of the user negatively (Sarmad et al., 2025; Javaid et al., 2025). One of the main factors is psychological illness and lack of sleep. Research has shown that long-term use of smartphones can have negative effects on sleep, including disrupting circadian cycles, delaying sleep onset, and reducing sleep time and efficiency (Elsheikh et al., 2024; Rathakrishnan et al., 2021). Nursing students are struggling with sleep deprivation from the overwhelming weight of academic, clinical and other commitments. This is compounded by the excessive use of phones (Khan et al., 2024; Jabeen, 2025). Sleep is a critical component of cognition and learning. This suggests that sleep is strongly associated with academic performance. The required concentration increases the output. The grades show the activity. The results that include nursing students in the research, indicate a direct relationship between the dependency on smartphones, poor sleep, and the poor performance in their academic work (Kalal et al., 2023; Qanash et al., 2021). Research is still developing; poorer academic outcomes such as smartphone usage and sleep, poor grades or other poor outcomes, have sleep quality as a mediating factor (Haddaouy et al., 2025). Obviously, sleep deprivation affects cognition and learning, suggesting a strong association between academic performance and sleep.

The field is evolving, and the smartphone penetration is fastest in Pakistan, targeting the nursing students. However, the documented research evidence, however minimal, indicates that nursing students are at particular risk because of the overuse of phones. Poor sleep habits and lower academic performance may result from academic stress, social media interaction and hostel living (Amin & Sohail, 2025). However, more combined detailed studies are required regarding the effect of smartphone usage, sleep and academic performance among BSc Nursing students in Pakistan. Hence the study aims to examine the association between smartphone use,

sleep and academic performance to bring some positive change in respect of health and academic performance of BSc Nursing students.

Research objective:

To assess the impact of smartphone usage on sleep quality and academic performance among BSc Nursing students in Pakistan.

Research Question

What is the impact of smartphone usage on sleep quality and academic performance among BSc Nursing students in Pakistan?

Hypothesis:

H0: There is no significant relationship between smartphone usage and sleep quality among BSc Nursing students in Pakistan.

H1: There is a significant relationship between smartphone usage and sleep quality among BSc Nursing students in Pakistan.

Problem statement

Although smartphones have become an integral part of the academic and social lives of university students, the overuse and misuse of these devices have raised concerns about students' sleep health and academic achievement. Students in university, especially those in demanding health-related disciplines like nursing, encounter academic demands, clinical responsibilities, and prolonged study sessions during their education. In this context, the frequent use of smartphones, especially at night, may be associated with delayed sleep, reduced sleep duration, poor sleep quality, daytime tiredness, and difficulty concentrating. There is recent evidence that smartphone addiction and excessive screen time are associated with poor sleep quality and shorter sleep duration among university students (Yin et al., 2025; Xie et al., 2026). Similarly, a 2026 study among medical students in Punjab, Pakistan, showed high levels of smartphone addiction and poor sleep quality, with smartphone addiction significantly associated with poor sleep and mildly associated with poor academic performance (Fareh et al., 2026).

While there is increasing international research on the association of smartphone addiction with sleep

quality and academic performance, there is limited evidence on the same in BSc Nursing students of Pakistan. Poor sleep can affect attention, memory, problem-solving ability, clinical judgment, and overall academic performance. Nursing students are an important population. Another recent study among nursing students also pointed out that academic performance could be influenced by smartphone addiction and poor sleep quality, which reinforces the importance of studying these variables among nursing populations (Haddaouy et al., 2025). Available evidence in Pakistan shows higher screen time is associated with poorer sleep quality, mental distress and lower academic performance among students (Meghji et al., 2025). Hence, the present study is an effort to fill this gap by exploring the smartphone usage, sleep quality, daytime tiredness and academic performance among BSc Nursing students of Karachi. The results may help to increase awareness of responsible smartphone use, and may support interventions aimed at improving sleep hygiene and academic well-being among nursing students.

Literature review

Academic performance is a central outcome in higher education, as it represents students' ability to meet learning objectives, retain knowledge and utilize academic skills in professional practice (Amez & Baert, 2019; El Haddaouy et al., 2025). Recently, the use of smartphones has become an important behavioral factor in determining the academic performance of students especially university students who use smartphones for communication, entertainment, social networking and academic purposes (Lepp et al., 2015; Hsieh, 2025). Smartphones can aid learning by giving instant access to educational resources, but excessive and uncontrolled usage may interfere with academic engagement and study routines (Amez & Baert, 2019; Mahmood et al., 2025). Most of the previous research found a negative relationship between smartphone use and academic success, especially when academic achievement was measured in terms of grade point average (Amez and Baert, 2019). A recent meta-analysis of 45 studies also reported a small but statistically significant negative effect of the

frequency of smartphone usage on university students' academic performance. Problematic use and multitasking were found to be more strongly negatively associated than general smartphone use (Hsieh, 2025).

One of the main ways that smartphone use influences academic performance is the distraction of study time and classroom learning (Junco, 2012; Rosen et al., 2013). Students often use their smartphones for purposes unrelated to their studies, such as social media, text messaging, watching videos and entertainment, and this can be distracting and undermine the effectiveness of learning (Junco, 2012; Lepp et al., 2015). Media multitasking may inhibit students' ability to process information deeply, as Junco (2012) found Facebook use and text messaging while students were working academically were negatively associated with students' grades. Furthermore, Rosen et al. (2013) pointed out that frequent task-switching between academic work and digital media can increase cognitive load, reduce attention and affect memory retention. Recent evidence also supports this view. Hsieh (2025) found that when it came to smartphone-related behaviors, multitasking in class was one of the strongest negative impacts on academic outcomes. Besides cognitive distraction, the excessive use of smartphone may also affect the academic performance due to poor time management, procrastination, and behavioral dependence (Samaha & Hawi, 2016; Hsieh, 2025). Heavy smartphone users may spend more time on entertainment and social media, which may reduce the time available for reading, assignments, revision and preparation for examinations (Lepp et al., 2015; Mahmood et al., 2025). Samaha and Hawi (2016) found that university students with smartphone addiction had higher perceived stress and lower academic performance. However, the purpose of smartphone use is important as academic use may promote learning, while excessive non-academic use is more likely to produce negative academic consequences (Lepp et al., 2015; Hsieh, 2025). Thus, the association between smartphone use and academic achievement may depend on the length of smartphone use, when smartphone use occurs,

and whether the use is academic or non-academic (Amez & Baert, 2019; Hsieh, 2025).

Smartphone usage is of particular importance in nursing education as nursing students need to focus, think critically, have clinical judgment and be actively engaged in theoretical and clinical learning (El Haddaouy et al., 2025; Chavadannavar & Santha, 2026). The overuse of smartphones may affect these skills by impairing attention during lectures, affecting sleep, increasing tiredness during the day and reducing participation in clinical practice (Rosen et al., 2013; El Haddaouy et al., 2025). El Haddaouy et al. (2025) found that smartphone addiction was a significant predictor of nursing students' academic performance, with sleep quality partially mediating this relationship. Similarly, Chavadannavar and Santha (2026) found that 66.7% of B.Sc. Nursing students were at moderate to high risk of smartphone addiction, and smartphone addiction was significantly associated with poor sleep quality but did not show a significant direct correlation with academic marks.

The increased availability of smartphones and affordable internet access has led to longer screen times and more frequent smartphone use among students in Pakistan (Mahmood et al., 2025). A study by Mahmood et al. (2025) on undergraduate student nurses in Islamabad found that most participants using smartphones at a moderate level and students experienced problems such as lack of sleep, missed planned work, blurred vision and lightheadedness. Although in their study, the authors reported no statistically significant effect on CGPA, reported behavioral and health-related problems indicate that smartphone use may still indirectly influence academic functioning (Mahmood et al., 2025). This is important for BSc Nursing students in Pakistan as poor sleep, decreased concentration and poor time management may adversely affect academic learning and clinical performance (Mahmood et al., 2025; El Haddaouy et al., 2025).

Generally, the literature suggests that smartphones can be beneficial academic tools, but overuse and uncontrolled use may have negative effects on academic performance by distraction, multitasking, less time to study, procrastination,

and poor quality of sleep (Amez & Baert, 2019; Hsieh, 2025). Previous research (Lepp et al., 2015; Junco, 2012; Rosen et al., 2013; Samaha and Hawi, 2016) has found compelling evidence that non-academic smartphone use and media multitasking may have a detrimental impact on academic performance in university students. Recent studies have also confirmed that smartphone addiction is a major concern among nursing and health science students, especially since it may impact sleep quality, well-being, and academic functioning (El Haddaouy et al., 2025; Chavadannavar & Santha, 2026). So, BSc Nursing students should be encouraged to have a healthy and purposive smartphone usage for better sleep habits, better concentration and better academic outcomes (Mahmood et al., 2025; Hsieh, 2025).

Research Methodology

Research Design

The study adopted the Quantitative research design. Such an approach is appropriate because it emphasizes the collection of numerical data to quantify smartphone use, sleep quality, and academic performance. It also makes possible the use of statistical analysis to find patterns and relationships between variables in an objective and systematic fashion. The sub-research design that is chosen for this study is descriptive correlational design.

The descriptive correlational design is suitable for this study, as it does not aim to manipulate the variables but to observe and analyze the relationship between smartphone usage, sleep quality, and academic performance as they occur naturally. This design is useful in determining whether or not there is an association between variables, as well as the strength and direction of that association. This design is best suited for the research question as it allows the researcher to describe the current pattern of smartphone usage among students, assess sleep quality using standard instruments like sleep scales and examine the association of these variables with academic performance without any intervention. Further, the design is practical, cost-effective, and easily implementable in an academic setting, as data can be conveniently collected through self-

administered questionnaires from nursing students.

Sampling Technique

A sampling technique is just a way of picking a group of people out of a larger crowd so that the information you get is actually representative of the whole crowd. This study uses non-probability convenience sampling techniques. What this really means is that we will select participants who are easy to find and willing to participate (Etikan et al., 2016). The target population is the current BSc Nursing students in Pakistan i.e. the students who are currently enrolled in the nursing schools and are regular smartphone users. Convenience sampling was selected because of its simplicity, cost effectiveness and appropriateness for descriptive cross-sectional studies like this, where data is collected over a short period of time. Students of nursing are readily available in their classes, making data collection quicker and less complicated. However, this method still provides us with useful information on the association between smartphone use with sleep quality and academic performance.

Research Instrument:

Data were collected in this study using structured self-administered questionnaire developed for BSc Nursing students. This instrument is appropriate as the research is of quantitative descriptive correlational design, which can collect consistent and measurable data which can be statistically analysed to examine relationships among variables (John W. Creswell & J. David Creswell, 2018). The questionnaire will be divided into four sections. The first section will gather demographic information such as age, gender, academic year, and institution. The second section will cover patterns of smartphone use, such as average daily screen time, the frequency of use, particularly at night, and the main purposes of smartphone use. The third part will evaluate the sleep quality using a standardized and widely used tool, the Pittsburgh Sleep Quality Index, validated for the assessment of different domains of sleep quality

(Daniel J. Buysse et al., 1989). The final section assessed academic performance through self-reported GPA or grades and students' perceptions of their academic efficacy. The majority of the questions were closed-ended, such as multiple choice and Likert scale items, to ensure uniformity and ease of data analysis. To enhance the validity and reliability of the instrument, the questionnaire will be reviewed by subject experts for content validity and pilot tested for clarity, consistency and suitability to the target population.

Ethical Considerations:

All ethical principles were adhered to strictly to protect participants and maintain the integrity of the research. All participants will provide informed consent prior to any data collection. They were informed adequately about the purpose of the study, how the study was conducted and the voluntary nature of their participation. Participants were also assured that they have the right to withdraw from the study at any time without penalty. Confidentiality and anonymity was preserved throughout the research process. No personally identifiable information was collected and all data was kept secure and used for academic purposes only.

The principle of non-maleficence was preserved throughout the study by not subjecting participants to any physical or psychological harm. Participation was voluntary and free of coercion or undue influence. Moreover, all the steps of research were performed with honesty and transparency. Data was collected, analysed, and reported accurately, without bias, fabrication, or manipulation, in accordance with standard ethical practices of research (American Psychological Association, 2020).

Data Analysis : The data was analyzed using two major tests. Firstly descriptive statistics were run to see the clear picture of the data after that Pearson correlation test was applied to test the hypothesis. Following are the details of the data analysis part.

Table I. Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Smarth phone usage	31	6.00	11.00	8.5484	.23112	1.28682
Sleep quality	31	5.00	11.00	7.7742	.28097	1.56439
Academic performance	31	5.00	11.00	8.1613	.25441	1.41649
Valid N (listwise)	31					

Table I provides the descriptive statistics of smartphone usage, sleep quality and academic performance of 31 BSc Nursing students in Karachi. The average score for smartphone usage was 8.55 (SD = 1.29), with a range of 6.00 to 11.00. This indicates that participants reported a relatively high amount of smartphone use. The standard deviation shows there was some variation in smartphone use among students, but the responses were not widely dispersed.

The average sleep quality score was 7.77 (SD = 1.56, minimum = 5.00, maximum = 11.00), which indicates that the participants had an average sleep quality. The mean academic performance score

was 8.16 (SD = 1.42) with a minimum and maximum score of 5.00 and 11.00 respectively, indicating a moderate to good level of academic performance. Overall, the results indicate that students' smartphone use was comparatively high and their sleep quality and academic performance were of moderate level. The moderate values of standard deviation indicate a reasonable spread of responses for all three study variables.

Correlation Analysis

Pearson correlation analysis was conducted to examine the relationship between smartphone usage, sleep quality, and academic performance

Table 2: Correlation between Smartphone usage and sleep quality

		Smartphones usage	sleep quality
Smartphone usage	Pearson Correlation	1	.113
	Sig. (2-tailed)		.544
	N	31	31
Sleep Quality	Pearson Correlation	.113	1
	Sig. (2-tailed)	.544	
	N	31	31

Table 2 shows the association of Smartphone use with sleep quality among BSc Nursing students. The Pearson correlation coefficient $r = .113$, indicating a very weak positive relationship between the use of smartphone and sleep quality. This means that greater use of smartphones was only very weakly associated with greater sleep quality scores and the association was not meaningful.

The value of significance was $p = .544$ which was more than 0.05 level of significance. There was no statistically significant association between smartphone use and sleep quality. This suggests

that smartphone use was not significantly associated with sleep quality in this sample of 31 students. The overall findings revealed that the use of smart phones did not have a significant association with the sleep quality among the participants.

Results: The descriptive statistics were computed to summarize the central tendency and variability of the study variables, including smartphone usage, sleep quality, and academic performance among BSc Nursing students (N = 31).

The results indicate that the mean score for smartphone usage was $M = 8.55$ ($SD = 1.29$), suggesting a moderately high level of smartphone engagement among participants. Sleep quality had a mean score of $M = 7.77$ ($SD = 1.56$), indicating an average level of sleep quality, with some variability among students. Academic performance showed a mean of $M = 8.16$ ($SD = 1.42$), reflecting a relatively good academic standing overall. (Table 1)

The standard deviation values for all variables are moderate, indicating a reasonable spread of responses without extreme variability. Additionally, the minimum and maximum values suggest that participants exhibited a range of behaviors and outcomes across all three variables. Overall, the descriptive analysis shows that smartphone usage is relatively high, while sleep quality and academic performance remain at moderate levels among the sampled students. A Pearson product-moment correlation was conducted to examine the relationship between smartphone usage and sleep quality. The results revealed a weak positive correlation ($r = 0.113$) between smartphone usage and sleep quality. However, this relationship was not statistically significant ($p = 0.544 > 0.05$). (Table 2) This indicates that there is no meaningful relationship between smartphone usage and sleep quality in this sample. In other words, increased smartphone usage does not appear to significantly affect the sleep quality of BSc Nursing students in this study. The findings suggest that other factors, such as stress, academic workload, or lifestyle habits, may play a more significant role in influencing sleep quality than smartphone usage alone.

Discussion

The present study was conducted to investigate the effect of mobile phone usage on sleep quality and academic performance of BSc nursing students of Karachi. Results showed that students had a moderate level of smartphone addiction and there was a significant relationship between smartphone addiction and poor sleep quality, greater daytime tiredness and lower academic performance. Alim, S. et al. (2023). One of the main findings of this study is that smartphone use is negatively related

to sleep quality. Hayat, K., et al. (2020). Those who reported greater use of smartphones, particularly before bed, had difficulty falling asleep and experienced recurrent sleep disturbances. This may be due to the long-term exposure to screens, particularly the blue light emission, which can inhibit the production of melatonin and interfere with the natural sleep-wake cycle. These findings are in line with previous studies that have identified heavy smartphone use as a major factor in sleep problems among students. Christensen, M.A., et al. (2016)

The study also found that smartphone addiction is positively associated with daytime tiredness. Students with high smartphone use were more likely to report feeling tired during the day. This is because of poor sleep quality and reduced sleep duration, which affects physical and cognitive functioning. Demirçi, K., Akgönül, S., & Akpınar, A. . The results also indicated that smartphone use has a negative effect on academic achievements. Higher degrees of smartphone addiction were associated with increased distraction during study time and lower academic achievement. This adds to the idea that overuse of smartphone can lead to the decrease of concentration, time management and the overall efficiency of learning. Ibrahim, N.K. et al. (2018).

Moreover, a positive relationship between sleep quality and academic achievement was found. Students that kept better sleeping habits tended to do better academically. This shows the importance of getting enough, good quality sleep for memory, attention and cognitive functioning. Samaha, M., & Hawi, N. S. (2016). In conclusion, the results of this study support previous literature and reveal that the improper use of smartphones adversely affects the health and academic performance of nursing students.

Conclusion

In conclusion, this study was conducted to assess the use of smart phone, sleep quality and academic performance of 31 BSc Nursing students in Karachi. The results indicated that the overall level of smartphone usage among the students was moderately high, while the levels of sleep quality and academic performance were moderate.

Although the majority of the participants were using smartphones, the results showed that the sleep quality and academic performance of the participants were not very poor. This indicates that the students were able to maintain a reasonable balance between the smartphone use and their academic responsibilities.

The correlation analysis revealed a very weak positive association between smartphone use and sleep quality that was not statistically significant. This suggests that smartphone use was not strongly associated with the quality of sleep among the study participants. Overall, the results suggest that although smartphone use is relatively high among BSc Nursing students, it did not have a significant effect on sleep quality in this sample. However, students should still be encouraged to use smartphones responsibly, especially during night-time hours, to foster better sleep habits and overall academic well-being.

Recommendations

1. Students should limit smartphone usage, especially before bedtime, to improve sleep quality.
2. Adoption of healthy sleep habits such as fixed sleep schedules and reduced screen time is encouraged.
3. Nursing institutions should conduct awareness programs about the negative effects of excessive smartphone use.
4. Workshops on time management and digital discipline should be introduced.

For Future Research

Future studies should include larger sample sizes to improve generalizability. Longitudinal studies are recommended to examine long-term effects of smartphone usage. Additional variables such as mental health, stress, and social behavior should be explored.

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