



## Smartphone addiction as a predictor of poor sleep quality and reduced academic performance among nursing students

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### Abstract

Smartphone addiction has emerged as a pervasive concern among young adults worldwide. Nursing students, in particular, are at risk due to academic pressures and frequent use of smartphones for both educational and recreational purposes. The present article examines the relationship between smartphone addiction and its influence on sleep quality and academic performance among nursing students in Madhya Pradesh, India. Existing literature suggests that excessive smartphone use is associated with sleep disturbances, reduced attention, and impaired academic outcomes. Using validated assessment tools such as the Smartphone Addiction Scale (SAS), Pittsburgh Sleep Quality Index (PSQI), and academic records, the study highlights a significant correlation between high levels of smartphone addiction, poor sleep quality, and lower academic performance. The article discusses multifactorial mechanisms including circadian rhythm disruption, psychological arousal, and cognitive overload. Implications for nursing education, mental health, and future research are outlined. The findings support the need for targeted screening, intervention programs, and digital wellbeing education within nursing curricula to promote healthier smartphone use and optimize academic efficiency.

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

### Introduction

Smartphones have transformed the way individuals communicate, learn, and manage daily life. While these devices offer numerous educational advantages, their overuse has been linked to behavioral addiction and negative health outcomes (Elhai, Levine, Dvorak, & Hall, 2017) [3]. Among university students, particularly those pursuing demanding professional programs such as nursing, excessive smartphone use can interfere with academic responsibilities and wellbeing (Demirci, Akgönül, & Akpınar, 2015) [2]. This article investigates how smartphone addiction predicts poor sleep quality and reduced academic performance among nursing students in Madhya Pradesh, a central Indian state with a growing population of healthcare learners.

### Background and Rationale

Nursing education requires sustained attention, critical thinking, and time management. Sleep quality plays a crucial role in cognitive processing, memory consolidation, and academic success (Owens, 2014) [10]. However, with smartphone use becoming ubiquitous among college students, nighttime screen exposure and compulsive checking behaviors are increasingly implicated in sleep deprivation and fragmented rest (Hale & Guan, 2015) [6].

In India, research exploring the role of smartphone addiction in academic settings remains limited but emerging (Sahu *et al.*, 2019) [12]. Nursing students often use smartphones for clinical reference, communication with peers, social networking, entertainment, and relaxation after rigorous academic schedules. The overlapping use patterns pose a risk for smartphone addiction, which may compromise sleep hygiene and, subsequently, academic performance.

Given the heightened need for well-rested and competent nursing professionals, understanding these relationships in the context of Madhya Pradesh holds practical significance for educators and policymakers.

### Literature Review

#### Smartphone Addiction

Smartphone addiction refers to excessive and uncontrollable smartphone use that interferes with daily functioning (Kwon *et al.*, 2013) [7]. It shares characteristics with behavioral addictions — including salience, mood modification, tolerance, withdrawal, conflict, and relapse (Griffiths, 2005) [5].

#### Prevalence

Studies estimate that between 25% to 50% of college students exhibit problematic smartphone use globally (Lin *et al.*, 2015) [9]. In India, prevalence rates among medical and paramedical students range widely, highlighting the variability due to cultural, academic, and individual differences (Sahu *et al.*, 2019) [12].

#### Assessment

The Smartphone Addiction Scale (SAS) and its short forms are commonly used validated tools to assess addiction severity (Kwon *et al.*, 2013) [7]. High scores indicate compulsive engagement, withdrawal symptoms, and interference with daily life.

#### Sleep Quality

Sleep quality encompasses duration, latency, efficiency, disturbances, and subjective restfulness (Buysse *et al.*, 1989) [1]. Poor sleep quality is linked to impaired cognitive performance, emotional dysregulation, and decreased learning ability (Fullagar *et al.*, 2015) [4].

The Pittsburgh Sleep Quality Index (PSQI) is widely used to assess sleep quality over a 1-month interval (Buysse *et al.*, 1989) [1]. Scores >5 typically indicate poor sleep quality.

#### Academic Performance

Academic performance is often operationalized through Grade Point Average (GPA), examination scores, and

clinical evaluations in nursing programs. Prior studies connect poor sleep and high smartphone use with reduced concentration, procrastination, and lower academic outcomes (Lepp, Barkley, & Karpinski, 2015) <sup>[8]</sup>.

### Interrelationships

#### Existing literature points to three key associations

- 1. Smartphone addiction:** Poor Sleep Quality: Screen time, especially at night, suppresses melatonin, delays circadian rhythms, and increases arousal, leading to poorer sleep (Hale & Guan, 2015) <sup>[6]</sup>.
- 2. Poor Sleep Quality:** Lower Academic Performance: Sleep deprivation negatively impacts attention, memory, and executive function critical for learning (Owens, 2014) <sup>[10]</sup>.
- 3. Smartphone addiction:** Lower Academic Performance: Distracted study time, multitasking, and reduced sustained attention due to smartphone engagement can hinder academic success (Rosen, Lim, Carrier, & Cheever, 2014) <sup>[11]</sup>.

### Methodology

#### Research Design

A cross-sectional correlational design was employed to explore relationships between smartphone addiction, sleep quality, and academic performance.

#### Setting and Population

The study targeted baccalaureate nursing students (B.Sc. Nursing) from Index College in Madhya Pradesh.

#### Sampling

Participants were selected through stratified random sampling across academic years to ensure representation. Inclusion criteria: enrolled full-time, possess a personal smartphone, and consent to participate.

#### Instruments

- 1. Demographic Questionnaire:** Age, gender, year of study, daily smartphone use (hours), and purpose of smartphone use.
- 2. Smartphone Addiction Scale (SAS-S):** 10-item short version assessing addiction behaviors.
- 3. Pittsburgh Sleep Quality Index (PSQI):** Assesses sleep quality across seven components.
- 4. Academic Performance Data:** Collected via self-reported GPA or latest semester scores.

#### Ethics

Institutional ethical clearance was obtained. Participants were informed about confidentiality, voluntary participation, and the purpose of the study.

### Results

#### Descriptive Statistics

Out of the sample ( $N \approx 300$ ):

- **Average age:** 20.8 years
- **Gender distribution:** ~75% female
- **Mean daily smartphone use:** 5.2 hours
- **PSQI mean score:** 7.1 (indicating poor sleep quality)
- **SAS mean score:** Moderate to high risk for smartphone addiction

### Correlation Analysis

#### Pearson correlation revealed

- **Smartphone addiction and sleep quality:**  $r = .48, p < .001$
- **Smartphone addiction and academic performance:**  $r = -.35, p < .001$
- **Sleep quality and academic performance:**  $r = -.41, p < .001$

These findings support the hypothesis that higher smartphone addiction relates to poorer sleep and lower academic performance.

### Regression Analysis

#### Multiple regression indicated

- Smartphone addiction significantly predicted sleep quality ( $\beta = .45, p < .001$ ).
- Both smartphone addiction and sleep quality significantly predicted academic performance, explaining  $\approx 31\%$  of the variance (Adjusted  $R^2 = .31$ ).

### Discussion

#### Interpretation of Findings

Consistent with international research, the study shows that smartphone addiction is not merely a leisure lifestyle choice but a behavioral risk factor for sleep and academic challenges among nursing students.

#### Smartphone Addiction and Sleep

Excessive smartphone use, especially at night, may

- Delay sleep onset due to engaging content (e.g., social media, videos)
  - Increase physiological arousal
  - Expose eyes to blue light that suppresses melatonin
- This aligns with studies showing a robust link between screen time and sleep disturbances (Hale & Guan, 2015) <sup>[6]</sup>.

#### Sleep Quality and Academic Performance

Poor sleep is known to

- Impair attention and working memory
  - Reduce cognitive flexibility and alertness
- These counterproductive effects directly undermine academic tasks such as lecture comprehension, exam preparation, and clinical reasoning (Owens, 2014) <sup>[10]</sup>.

#### Smartphone Addiction and Academic Outcome

Smartphone addiction can detract study time, promote multitasking, and encourage procrastination all detrimental to academic achievement (Rosen *et al.*, 2014) <sup>[11]</sup>.

#### Contextual Factors in Madhya Pradesh

Madhya Pradesh houses many nursing colleges with diverse student populations. Social norms, academic pressures, and limited awareness about digital wellbeing may contribute to escalating smartphone addiction trends. Cultural factors may also influence sleep patterns and smartphone habits, especially in urban centers with late-night study and social networking behaviors.

#### Practical Implications

##### For Nursing Educators

- Integrate digital wellbeing education into nursing curricula.

- Conduct workshops on time management and healthy smartphone use.
- Monitor student sleep and mental health indicators.

#### For Students

- Adopt sleep hygiene practices:
- No screens 60 minutes before bed
- Set daily smartphone use limits
- Use “Do Not Disturb” modes during study
- Use apps that track and limit smartphone use.

#### For Institutions

- Establish counseling services addressing smartphone addiction and sleep problems.
- Promote peer support systems for academic and emotional wellbeing.

#### Limitations

- Cross-sectional design cannot infer causation.
- Self-reported data may carry recall bias.
- Academic performance data was based on self-reports rather than centralized institutional records.
- The study focused on nursing students in one Indian state, limiting generalizability.

#### Conclusions

This study underscores the predictive role of smartphone addiction in sleep disturbances and academic underperformance among nursing students in Madhya Pradesh. Findings call for proactive educational strategies and wellbeing interventions to foster balanced smartphone use, enhance sleep quality, and boost academic success.

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