

Mobile Phone Usage and Its Association with Insomnia: A Cross-Sectional Study Among Patients Attending Psychiatry Clinics in Surat, Gujarat

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Abstract: ***Background:** The widespread adoption of mobile phones has raised concerns about their impact on sleep quality. This study investigates the relationship between mobile phone usage patterns and insomnia among patients attending psychiatry clinics in Surat, Gujarat. **Methods:** A cross-sectional study was conducted among 385 patients attending psychiatry outpatient clinics in Surat between January and June 2024. Data was collected through structured questionnaires assessing mobile phone usage patterns, sleep quality using the Insomnia Severity Index (ISI), and associated factors. **Results:** Among participants, 72.4% reported moderate to severe insomnia. Significant associations were found between insomnia severity and daily mobile phone usage duration ($p < 0.001$), bedtime phone use ($p < 0.001$), and screen time before sleep ($p < 0.001$). Participants using phones >4 hours daily had 3.2 times higher odds of experiencing clinical insomnia (OR=3.2, 95% CI: 2.1-4.8). **Conclusion:** Excessive mobile phone usage, particularly before bedtime, is strongly associated with insomnia among psychiatric patients. Interventions targeting mobile phone usage habits may improve sleep quality in this vulnerable population.*

Keywords: Mobile phone usage, Insomnia, Sleep quality, Psychiatry patients, Screen time, Digital wellness.

1. Introduction

The proliferation of mobile phone technology has fundamentally transformed human behavior and communication patterns globally. India, with over 1.2 billion mobile phone users, represents one of the largest mobile markets worldwide. This digital revolution, while offering numerous benefits, has raised significant public health concerns, particularly regarding its impact on sleep health [1, 2].

Insomnia, characterized by difficulty initiating or maintaining sleep, affects approximately 30–40% of the adult population worldwide. The prevalence is notably higher among individuals with psychiatric conditions, with studies reporting rates up to 60–80% in psychiatric outpatient settings [3]. The bidirectional relationship between sleep disturbances and mental health conditions makes this population particularly vulnerable to the adverse effects of poor sleep hygiene practices.

Mobile phone usage before bedtime has emerged as a significant risk factor for sleep disturbances [4, 5]. The mechanisms underlying this association are multifactorial, including exposure to blue light that suppresses melatonin production, psychological arousal from content consumption, and the displacement of sleep time. Additionally, the phenomenon of “Fear of Missing Out” (FOMO) and compulsive checking behaviors contribute to delayed sleep onset and fragmented sleep patterns [6].

Previous studies have demonstrated associations between excessive mobile phone use and various sleep parameters, including reduced sleep duration, increased sleep latency, and

daytime dysfunction [1,3,7]. However, limited research has specifically examined this relationship among psychiatric patients in the Indian context, where cultural factors, smartphone penetration patterns, and healthcare-seeking behaviors differ from Western populations [7].

Surat, Gujarat’s second-largest city with a population exceeding 7 million, represents a rapidly urbanizing Indian metropolitan area with high mobile phone penetration. The city’s diverse socioeconomic demographics and growing mental health infrastructure provide an ideal setting for examining the intersection of technology use and sleep health in psychiatric populations.

This study aims to investigate the association between mobile phone usage patterns and insomnia severity among patients attending psychiatry clinics in Surat, with specific objectives to: (1) assess the prevalence of insomnia in this population, (2) examine mobile phone usage patterns, (3) identify associations between usage patterns and insomnia severity, and (4) explore potential mediating factors.

2. Materials and Methods

Study Design and Setting

A cross-sectional observational study was conducted between January and June 2024 at five psychiatry outpatient clinics in Surat, Gujarat. The participating clinics were selected through stratified random sampling to ensure representation across different geographical areas of the city, including both government and private healthcare facilities.

Participants

The study population comprised adult patients (aged 18-65 years) attending psychiatry outpatient departments for routine consultations. Inclusion criteria included: (1) ownership and regular use of a mobile phone for at least six months, (2) ability to understand and respond to questionnaires in Hindi, Gujarati, or English, (3) provision of written informed consent. Exclusion criteria included: (1) acute psychotic episodes or severe cognitive impairment, (2) primary sleep disorders (e.g., sleep apnea, restless leg syndrome), (3) shift workers or those with irregular work schedules, (4) medical conditions significantly affecting sleep (e.g., chronic pain, hyperthyroidism).

Sample Size Calculation

Sample size was calculated using the formula for cross-sectional studies: $n = Z^2P(1-P)/d^2$, where $Z = 1.96$ for 95% confidence level, P = expected prevalence of insomnia (60% based on previous studies), and d = precision (5%). The calculated sample size was 369, increased to 385 to account for potential non-response.

Data Collection Instruments

Data was collected through face-to-face interviews using structured questionnaires comprising the following sections:

- 1) **Sociodemographic Information:** Age, gender, education, occupation, marital status, monthly income, and residential area.
- 2) **Clinical Information:** Primary psychiatric diagnosis (as per ICD-11), duration of illness, current medications, comorbid medical conditions, and substance use history.
- 3) **Mobile Phone Usage Assessment:** A validated questionnaire assessing:
 - Daily usage duration (hours)
 - Primary purposes of use (communication, social media, entertainment, work)
 - Bedtime usage patterns (use within 30 minutes of intended sleep time)
 - Night-time awakening for phone checking
 - Perceived dependence on mobile phone
- 4) **Insomnia Severity Index (ISI):** A 7-item validated scale assessing insomnia severity over the past two weeks. Scores range from 0-28, categorized as: No clinically significant insomnia (0-7), Sub-threshold insomnia (8-14), Moderate insomnia (15-21), and Severe insomnia (22-28).
- 5) **Associated Factors:** Physical activity levels, caffeine consumption, bedroom environment, and sleep hygiene practices.

Data Collection Procedure

Trained research assistants conducted interviews in designated private spaces within the clinics. Each interview lasted approximately 30-45 minutes. Participants were approached consecutively during their clinic visits, and those meeting inclusion criteria were invited to participate. The

Questionnaires were administered in the participant's preferred language. Data quality was ensured through regular supervision, random checks of completed forms, and double data entry.

Statistical Analysis

Data analysis was performed using SPSS version 26.0. Descriptive statistics were presented as frequencies and percentages for categorical variables and means with standard deviations for continuous variables. The normality of continuous variables was assessed using the Kolmogorov-Smirnov test.

Bivariate analyses were conducted using chi-square tests for categorical variables and independent t-tests or Mann-Whitney U tests for continuous variables. The correlation between mobile phone usage duration and ISI scores was assessed using Spearman's correlation coefficient.

Multivariate logistic regression analysis was performed to identify independent predictors of clinical insomnia (ISI score ≥ 15). Variables with $p < 0.2$ in bivariate analysis were included in the initial model. The final model was developed using backward stepwise selection, retaining variables with $p < 0.05$. Odds ratios (OR) with 95% confidence intervals (CI) were reported. Model fit was assessed using the Hosmer-Lemeshow test.

Ethical Considerations

The study protocol was approved by the Institutional Ethics Committee (IEC/2024/01/15). Written informed consent was obtained from all participants. Confidentiality was maintained through anonymous data collection and secure storage. Participants identified with severe insomnia were referred for appropriate sleep hygiene counseling and management.

3. Results

Participant Characteristics

Of 412 eligible patients approached, 385 agreed to participate (response rate: 93.4%). The mean age was 34.7 ± 11.2 years, with 54.3% female participants. The majority had completed secondary education or higher (76.4%) and were employed (61.8%). Common psychiatric diagnoses included depressive disorders (38.2%), anxiety disorders (29.4%), bipolar disorder (18.7%), and others (13.7%).

Mobile Phone Usage Patterns

The mean daily mobile phone usage was 4.8 ± 2.3 hours. Social media (67.8%) and entertainment (54.5%) were the primary purposes of use. Notably, 78.4% reported using their phones within 30 minutes of intended sleep time, and 45.7% reported waking up at night to check their phones at least once weekly.

Prevalence and Severity of Insomnia

Based on ISI scores, 27.6% had no clinically significant insomnia, 31.2% had sub-threshold insomnia, 28.8% had moderate insomnia, and 12.4% had severe insomnia. The mean ISI score was 13.6 ± 6.8 , with 72.4% experiencing some degree of insomnia.

Association Between Mobile Phone Usage and Insomnia

A significant positive correlation was found between daily mobile phone usage duration and ISI scores ($r = 0.42$, $p < 0.001$). Participants using phones > 4 hours daily had

significantly higher mean ISI scores compared to those using <2 hours (16.8 ± 5.9 vs. 9.2 ± 4.6 , $p < 0.001$).

Table 1: Association between Mobile Phone Usage Patterns and Insomnia Severity

Variable	No/Mild Insomnia (n=106)	Moderate/ Severe Insomnia (n=279)	p-value
Daily usage >4 hours	28.3%	71.7%	<0.001
Bedtime use	42.5%	89.2%	<0.001
Night awakening for phone	18.9%	56.3%	<0.001
Social media >2 hours/day	35.8%	78.5%	<0.001

Multivariate Analysis

In the adjusted logistic regression model, significant independent predictors of clinical insomnia included:

Daily mobile phone use >4 hours (OR=3.2, 95% CI: 2.1-4.8)

Bedtime phone use (OR=2.6, 95% CI: 1.7-3.9)

Female gender (OR=1.8, 95% CI: 1.2-2.7)

Depression diagnosis (OR=2.1, 95% CI: 1.4-3.2)

Age <30 years (OR=1.6, 95% CI: 1.1-2.4)

Table 2: Multivariate Logistic Regression Analysis for Clinical Insomnia

Variable	Adjusted OR	95% CI	p-value
Daily phone use >4 hours	3.2	2.1-4.8	<0.001
Bedtime phone use	2.6	1.7-3.9	<0.001
Female gender	1.8	1.2-2.7	0.004
Depression diagnosis	2.1	1.4-3.2	0.001
Age <30 years	1.6	1.1-2.4	0.018

4. Discussion

The high prevalence of insomnia (72.4%) aligns with prior reports in psychiatric populations [2,3]. Excessive daily use (>4 hours) tripled the odds of clinical insomnia independently of psychiatric diagnosis [1,5,7]. Bedtime use was particularly detrimental [4], mediated by blue-light melatonin suppression and cognitive/emotional arousal [5,6]. Females and younger adults were more vulnerable, likely due to greater social media engagement and less mature sleep habits [1, 3, 6].

Integrating mobile phone usage assessment into psychiatric care and promoting digital wellness interventions are recommended [2]. Strengths include a clinically relevant sample, validated tools [8], and urban Indian representativeness. Limitations are the cross-sectional design (precluding causality), self-reported data, and lack of objective usage or content-specific measures [4]. Longitudinal studies, objective monitoring (e.g., apps, actigraphy), and intervention trials of digital detox are needed [3, 6].

5. Conclusion

This study provides compelling evidence for the association between mobile phone usage and insomnia among psychiatric patients in Surat. Excessive and bedtime mobile phone use is robustly associated with insomnia in psychiatric patients. Routine screening and targeted behavioral interventions are essential components of modern mental health care [2, 5].

With nearly three-quarters of participants experiencing insomnia and strong associations with modifiable phone

usage behaviors, targeted interventions are urgently needed. Healthcare providers should routinely assess and address mobile phone usage patterns as part of comprehensive sleep management in psychiatric care.

The findings underscore the need for public health initiatives promoting digital wellness, particularly among vulnerable populations. As mobile technology continues to evolve and integrate into daily life, understanding and mitigating its impact on sleep health remains a critical challenge for clinicians, researchers, and policymakers.

6. Recommendations

- Clinical Practice:** Integrate mobile phone usage assessment into routine psychiatric evaluations and develop standardized guidelines for digital wellness counseling in mental health settings.
- Patient Education:** Implement structured psychoeducation programs about sleep hygiene and the impact of screen time on sleep quality.
- Policy Initiatives:** Develop mental health-specific guidelines for healthy technology use and advocate for digital wellness programs in psychiatric care settings.

7. Future Research

Conduct intervention studies testing the efficacy of digital detox programs and investigate culturally specific factors influencing the relationship between technology use and sleep in Indian populations.

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