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The Correlation between Digital Device Usage Patterns and Sleep Quality Among Psychiatric Inpatients in the Pakistan Institute of Mental Health

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Abstract

Psychiatric inpatients experience common disturbances in their sleep patterns, which negatively affect their treatment response, together with their clinical mental state. The digital age demonstrates a connection between extensive, uncontrolled digital device use throughout evenings and sleep disturbances among users. Research performed in this field is scarce because it investigates this relationship specifically among psychiatric patients who are hospitalized. The study investigated whether psychiatric patients from a tertiary hospital showed any relationship between their digital device habits and sleep quality. This investigation used a quantitative correlational research approach. For this study, 150 adult psychiatric inpatients aged 18–65 were chosen through purposive sampling. The research employed two standardized tools for data collection. The researchers implemented two assessment tools to understand participants' digital device behavior: the Digital Device Usage Questionnaire (DDUQ) for tracking screen duration and content preferences, and the Pittsburgh Sleep Quality Index (PSQI) for sleep evaluation during the recent month. Demographic information was also gathered. A Pearson's correlation test on SPSS version 26 analyzed digital use variables and sleep quality scores. Results established a strong connection between total screen use and bad sleep outcomes ($r = 0.48$, $p < 0.001$). A positive relationship emerged between using digital devices in the evening and social media use and sleep problems ($r = 0.41$, $p = 0.002$, and $r = 0.37$, $p = 0.005$). Using educational digital content generated a weak negative relationship because $r = -0.18$ and $p = 0.042$. Research demonstrates the requirement of defined guidelines that control digital technology use during psychiatric inpatient care to enhance patients' sleep quality and recovery processes.

Keywords: Digital Device Usage, Sleep Quality, Psychiatric Inpatients, Screen Time, PSQI, Correlational Study

Introduction

The technology-driven modern age continues to strongly integrate digital devices, including smartphones, computers, and television screens and tablets, into our everyday routines (Thomas et al., 2022). Digital device usage patterns describe when people use different technologies throughout their day and which types of digital material they view in what situations, while tracking both duration and frequency (AL-Zoubi, 2023). The assessment of sleep quality consists of four components measuring how easily someone can fall asleep (latency), total sleep duration, sleep continuity measurements, and waking restfulness level (Fabbri et al., 2021). Psychiatric inpatients show vital connections between their behaviors using digital devices and their sleep patterns, yet the research examining such links falls short of needed exploration (Carpels et al., 2022). Sleep disturbances remain an established major health problem in psychiatric facilities since researchers found poor sleep affects between 70% and 80% of psychiatric inpatient patients (Hossain et al., 2020). Patients experience different sleeping disorders, including insomnia and hypersomnia, alongside problems with their standard sleep patterns and disturbances caused by psychotropic medication side effects (Liu et al., 2022). Digital device use within psychiatric inpatient settings has escalated due to improved mobile technology access and institutions loosening their technology restrictions. According to scientific studies, research shows that nighttime device usage and extended screen time create extra obstacles to obtaining quality sleep. The combined high level of digital engagement with sleep problems requires detailed research among particularly susceptible patient groups (Kearns et al., 2020).

Research has identified the biological and psychological pathways explaining why digital devices cause poor sleep outcomes. Screens that emit blue light activate a mechanism that reduces melatonin production, which helps maintain our regular sleep-wake cycle. Screen exposure interferes with melatonin production, so people experience longer sleep onset times and shorter rest periods (Akman, 2021). Media content that triggers high cognitive arousal and emotional distress through devices makes it hard for individuals to feel relaxed at bedtime. Psychiatric patients who experience difficulties with emotional management and stress disorders experience more substantial adverse effects, so their fragile sleep patterns become disrupted, leading to setbacks in treatment outcomes (Makateb et al., 2023). Psychiatric unit patients demonstrate increased vulnerability to device-related adverse effects, which manifest during their inpatient care period. Electronic devices typically remain unsupervised in institutions with minimal structured routines (Battista et al., 2021). Patients who have depression or anxiety commonly use mobile devices or tablets as ways to cope with distressing situations and feelings of loneliness when experiencing these conditions during nighttime hours (Unoki et al., 2021). Emotional and psychological healing requires healthy sleep, yet this habit stands to interrupt the sleep that patients desperately need. Digital devices in use during rest times create recovery delays and enhance psychiatric symptoms while adding complexity to treatment planning (Smith et al., 2022).

Research addressing the relationship between digital device usage and sleep quality remains scarce in psychiatric inpatient settings, although mounting concerns exist. Existing research focuses on adolescents together with the general population, yet neglects the distinct environmental factors that psychiatric inpatients experience (Hartley et al., 2022). The current collective research overlooks vital operational determinants, including digital content type, usage time, and user psychological state, while neglecting their potential influence on sleep outcomes. The existing

literature gaps demonstrate an urgent requirement for directed studies that contextualize their findings (Van Veen et al., 2020). Mental health nurses and other care providers must understand how technology affects their patients' sleep patterns (Weltens et al., 2021). Psychiatric settings exhibit poor sleep quality, which leads to more aggressive behaviors and emotional problems, worse patient compliance, and longer hospitalizations (Caruso et al., 2021). The nurse's strategic frontline location enables them to examine digital habits and teach patients sound sleep practices while designing strategies that restrict electronics usage before bed. Technology sleep issues managed by mental health professionals lead to improved patient treatment outcomes and recovery-supportive environments (Huang & Zhu, 2020).

This research project tests the relationship between psychiatric inpatients' digital screen habits and their sleep quality. The research results will provide evidence to direct healthcare institutions about device management rules and shape interventions for establishing better daytime practices. The research fills a significant gap in knowledge while helping psychiatric facilities meet their patient-focused approach to holistic mental healthcare delivery.

Methodology

Research employed quantitative dimensions along with correlational methods to study digital technology usage patterns and their effects on the sleep quality of psychiatric inpatients. A quantitative research design was selected to examine variable association strengths while avoiding experimental control of factors. The researchers conducted their study within psychiatric inpatient units at the Pakistan Institute of Mental Health, Rawalpindi. The study sample consisted of adult inpatients who spent at least five days in the hospital and received a psychiatrist's judgment of clinical stability. The calculation of 150 participants followed standard sample size methodology with a 95% confidence interval and 5% margin of error. Secondary data was collected from participants through purposive sampling among individuals who met the set inclusion requirements. Adult patients between 18 and 65 years old with normal mental status who provided consent and had digital access during hospitalization met the study requirements. Those with acute psychosis and severe cognitive impairment or neurodegenerative conditions did not qualify for participation.

Data Collection Instruments

Two established data collection tools served the research:

The Digital Device Usage Questionnaire (DDUQ) used structured self-report methodology to measure how often participants used digital devices and when they spent time with different digital content, including social media platforms, games, and videos. A panel of mental health experts tested the tool for validity, while a small number of psychiatric patients tested the instrument's clarity and relevance before final implementation. Adult psychiatric hospital inpatients evaluated their month-long sleep quality using the Pittsburgh Sleep Quality Index (PSQI), an established and validated assessment tool. The PSQI assessment's seven components measured sleep latency duration and disturbances, together with daytime dysfunction. The research team gathered demographic information about patients through structured demographic forms, which included their psychiatric history, diagnosis, admission length, and medication usage details. A double-check process verified all provided data using participant medical records for accuracy.

Data Collection Procedure

Eligible participants received individual approaches after obtaining administrative permission from the chosen facility. A complete explanation about research methods and procedure followed while obtaining signed informed consent was provided to each subject. The data collection process occurred in private areas that provided quietness and confidentiality. Research assistants received training to conduct assessments through interviews while using structured questionnaires so participants could share their responses with medical objectivity.

Data Analysis

Researchers used SPSS version 26 to input and analyze the questionnaire data. A descriptive statistical analysis presented mean scores along with frequency counts and percentage distributions to summarize demographic data and scores from the DDUQ and PSQI. The analysis used Pearson's correlation coefficient to measure the connection between digital device habit patterns and sleep quality through three variables: total screen duration, usage times throughout the day, and content choice. The study considered p-values under 0.05 significant for establishing the strength of the relationship between different variables.

Results and Analysis

Demographic Characteristics of Participants

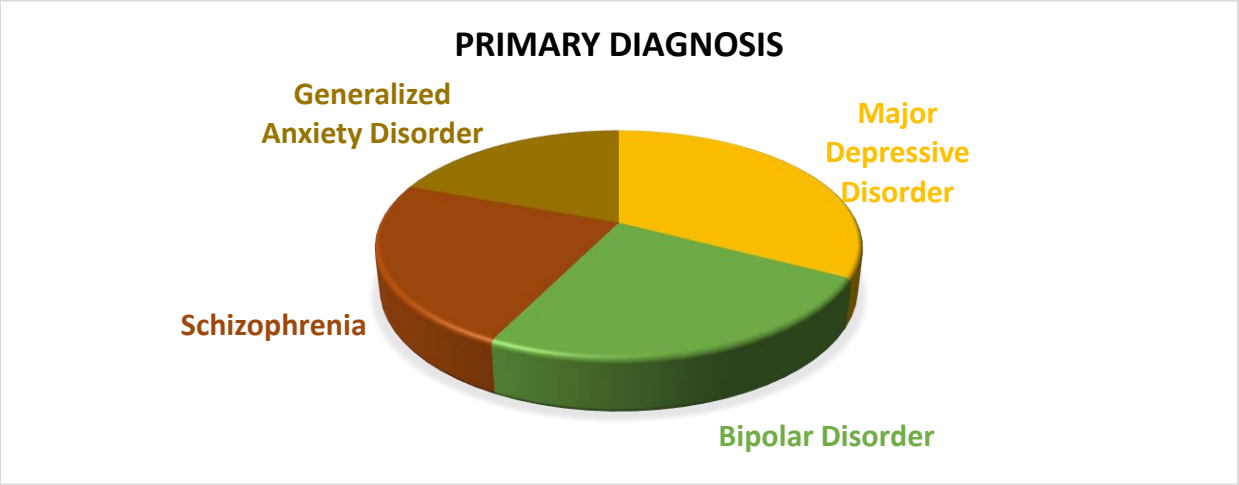
The research equally investigated 150 psychiatric inpatients across both genders (52% male and 48% female). The majority of participants fell within the age group of 31 to 45 years (43.3%) but were equally split between those 18–30 (28%) and 46–65 (28.7%). Major depressive disorder represented the primary diagnosis among psychiatric inpatients (32.7%), while nearly half the population received care for 5–10 days. (Table 1).

Table 1: Demographic Characteristics of Participants (N = 150)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	78	52.0
Female	72	48.0
Age Group (years)		
18–30	42	28.0
31–45	65	43.3
46–65	43	28.7
Primary Diagnosis		
Major Depressive Disorder	49	32.7
Bipolar Disorder	37	24.7
Schizophrenia	35	23.3
Generalized Anxiety Disorder	29	19.3
Length of Stay		
5–10 days	74	49.3
11–20 days	58	38.7
>20 days	18	12.0

Based on the data obtained, it can be observed that the most common primary diagnosis was Major Depressive Disorder with 49 cases, next in line is Bipolar Disorder, detected in 37 clients, Schizophrenia, detected in 35, and Generalized Anxiety Disorder in 29. This suggests that mood disorders are more common in the observed population as compared to anxiety and psychotic disorders (Figure 1).

Figure 1: Primary diagnosis of the participants



Digital Device Usage

Participants spent an average of 4.8 hours (SD = 1.9) each day using screens, with screen time varying between 1.2 and 9.4 hours daily. According to the study results, a substantial 62% of participants chose evening as their primary time to use digital devices. Social media appeared as the most popular digital content that users engaged with, according to 51% of research participants (Table 2).

Table 2: Digital Device Usage Patterns (DDUQ Scores)

Variable	Mean (SD)	Minimum	Maximum
Total daily screen time (hours)	4.8 (1.9)	1.2	9.4
Most frequent usage time	Evening (62%)		
Most common content type	Social media (51%)		

Sleep Quality

According to survey results, participants rated their sleep quality at 1.8 (SD = 0.6), showing that the majority of test subjects slept poorly. On average, participants required approximately 42.3 minutes (SD = 15.8) to fall asleep. Study participants slept on average 5.5 hours per night (SD = 1.2), but healthcare organizations recommend at least 7 hours of rest for optimal health. The participants rated sleep disturbances average (mean = 1.6, SD = 0.5) alongside noticeable daytime dysfunction (mean = 1.9, SD = 0.7). Results from the global PSQI showed psychiatric inpatients scored an average of 9.2, which reflects their overall sleep quality is considered poor (SD = 2.4) (Table 3).

Table 3: Sleep Quality Scores (PSQI Components)

PSQI Component	Mean (SD)	Interpretation
Subjective Sleep Quality	1.8 (0.6)	Fair to poor
Sleep Latency (mins)	42.3 (15.8)	Delayed
Sleep Duration (hours)	5.5 (1.2)	Below optimal
Sleep Disturbance	1.6 (0.5)	Moderate
Daytime Dysfunction	1.9 (0.7)	Noticeable
PSQI Global Score	9.2 (2.4)	Indicates poor sleep quality

Pearson Correlation

Total daily screen time generated moderate positive relationships with PSQI global scores ($r = 0.48$, $p < 0.001$), which established a direct link between extended screen use periods and worse sleep quality. Evening device screen time revealed a substantial connection ($r = 0.41$) with sleep problems ($p = 0.002$) while reinforcing the findings that delayed usage harms rest. Social media consumption demonstrated a weak to moderate relationship with sleep quality ratings ($r = 0.37$, $p = 0.005$), which provides evidence that media usage interferes with rest. The data showed no meaningful connection between sleep outcomes and morning device use ($r = -0.11$, $p = 0.156$). A weak negative connection appeared between educational content use and sleep quality ($r = -0.18$, $p = 0.042$) (Table 4).

Table 4: Pearson Correlation between Digital Device Use and Sleep Quality (N = 150)

Digital Device Use Variable	PSQI Global Score	p-value
Total screen time (hours/day)	r = 0.48	< 0.001
Evening usage	r = 0.41	0.002
Social media usage	r = 0.37	0.005
Morning usage	r = -0.11	0.156
Educational content usage	r = -0.18	0.042

Discussion

The current research study assessed digital device screen time usage patterns of psychiatric inpatients and their impact on patient sleep quality. It showed that higher screen time amounts during nighttime social media use led to reduced sleep quality. Available literature shows an association between digital engagement and sleep disturbances which specifically affects populations with special needs. The 9.2 score on the PSQI test among this group confirmed medically significant sleep impaired quality similar to findings across psychiatric and general population research (Brosnan et al., 2024).

Screen time throughout the entire day demonstrated a relationship with disrupted sleep patterns, which was classified as moderately positive. Studies by Zhong et al. (2025) showed that elevated screen usage, particularly close to bedtime, both delayed the start of sleep and shortened total sleep duration. People with psychiatric conditions tend to experience heightened sensitivity to environmental stimuli combined with pre-existing disturbances in their circadian patterns. The combination of evening digital device use with artificial screen light further increases this effect because both elements interfere with melatonin production and sleep phase timing (Barbotin et al., 2022).

Study participants who selected social media content as their preferred type experienced worse sleep quality scores. The research of Barbotin et al., (2022) corroborates findings that demonstrate how people with mood disorders show sleep difficulties because of their extensive social media engagement. Social media use triggers emotional reactions along with cognitive stimulation, which result in sleep disturbances. The results indicate timing stands as a crucial factor that determines how digital content affects sleep patterns because morning device use did not connect to PSQI scores.

Successful usage of educational digital content produced small yet measurable improvements in sleep quality. The findings support Altena et al., (2020), who reported how educational digital media with organized structures create routines that minimize anxiety to generate better sleep quality. Screen usage shows different results depending on what type of content people encounter so it becomes vital to understand how different mental tones affect rest time.

The present study findings differ from those of Hisler et al. (2020), who found a weak link between screen time usage and adolescent sleep problems because research suggests these relationships might depend on age group, along with psychiatric diagnosis status. The brain's adaptability to disruptions remains stronger among adolescents, but adult psychiatric patients must handle a combination of cognitive and pharmacological factors that intensify digital interference on their sleep patterns.

Research participants disclosed an average sleep duration of 5.5 hours, which falls below the 7–9 hour recommendation for adult rest. The findings reinforce Freeman et al., (2020) research on sleep dysfunction and mental health symptom interplay. When sleep quality deteriorates, psychiatric symptoms become more severe, along with irritability, cognitive impairment, and emotional dysregulation in a feedback loop that digital consumption without boundaries can enhance.

Conclusion and Recommendations

The research analysis revealed that digital device usage patterns produced substantial effects on psychiatric inpatients' sleep quality indicators. The research demonstrated that greater total screen usage throughout evenings coupled with emotional social media interactions led to worse sleep quality which caused Pittsburgh Sleep Quality Index (PSQI) scores to increase. Data indicated a different dynamic since patients who spent time with educational content through their devices demonstrated better sleep quality results. Digital behavior requires recognition as an essential element that healthcare professionals should use to enhance sleep quality in psychiatric patients whose mental health conditions already cause sleep disturbances.

The study's findings enable several practical suggestions. Psychiatric care facilities should make digital hygiene education part of standard patient' treatment protocols. Medical staff should teach patients about their screen time risks as they inform patients about proper digital technology usage, while specifically warning against evening use of devices. Digital habits must be part of clinical

assessments before healthcare professionals provide specific guidance to prevent sleep disturbances resulting from digital use. Inpatient facilities should establish structured digital curfews combined with quiet time policies to lower screen time exposure as patients prepare for sleep.

Healthcare providers should steer patients toward relaxing educational digital content rather than emotionally engaging media. The integration of guided digital tools featuring sleep hygiene components together with relaxation applications through mindfulness programs supports better sleep outcomes. Further investigation is needed because researchers should develop intervention strategies to test how digital restrictions or replacements affect sleep quality and mental health outcomes in psychiatric populations.

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