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Impact of Smartphone Addiction on Quality of Sleep and Psychological Well Being Among College Students

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ABSTRACT:

Background: Smartphone addiction has emerged as a growing public health concern, particularly among university students who are highly dependent on mobile devices for academic, social, and entertainment purposes. Excessive smartphone use has been linked to circadian rhythm disruption, sleep impairment, and increased psychological distress.

Method : A cross-sectional analytical study was conducted among 268 university students who met the cut-off criteria for smartphone addiction on the SAS-SV. Sleep quality was assessed using the PSQI, and psychological well-being was measured using the K10. Descriptive statistics and frequency distribution analyses were performed.

Results: A high proportion of students exhibited poor sleep quality, including delayed sleep onset, reduced duration, and nighttime awakenings. Moderate to severe psychological distress was observed in many participants. Addiction severity showed a clear association with poorer sleep outcomes and increased distress. Females reported slightly poorer sleep quality compared to males, whereas psychological distress levels were comparable.

Conclusion: Smartphone addiction significantly affects sleep patterns and psychological well-being in university students. High levels of dependency, coupled with behavioral and neurophysiological mechanisms, contribute to a cyclical pattern of sleep disruption and emotional instability. Early intervention and awareness programs are essential to mitigate long-term health consequences.

Keywords : Smartphone addiction, sleep quality, psychological distress, university students, SAS-SV, PSQI, K10

Introduction:

The era of artificial intelligence has bestowed upon intelligent minds a unique resource: cellphones. According to estimates, there were 2.5 billion smartphone users worldwide in 2019. India's official telecom statistics for 2019 show that the country's internet users who have smartphone connectivity have nearly tripled. [1]

Smartphones have revolutionized communication, information access, and entertainment, providing unprecedented connectivity and convenience. Smartphones have become essential tools for communication and instruction, but their rapid expansion and affordability have negatively impacted academic achievement, socioemotional functioning, and cognitive control. The rapid expansion of smartphone usage and heavy use have led to a need for more research on their effects on mental health. [2]

The process of addiction involves the use of a behaviour that can be used to both bring pleasure and serve as an escape from internal discomfort. This pattern of behaviour is defined by two things: 1. persistently being unable to control the behaviour (powerlessness) and 2. continuing the behaviour in spite of serious negative consequences (unmanageability). [3]

Studies have indicated that an addiction to smartphones can result in a range of issues, including social disorders, anxiety, depression, sleep disorders, mood disorders, and even self-destruction. College students of today are growing up with smartphones, which are now essential for college students' daily lives, and research. When compared to other societal professions, college students possess greater Internet access, favour forming connections online, and are more prone to experience smartphone addiction symptoms. Anxiety and other symptoms are referred to as psychological distress. psychological strain, depression, and a lack of wellbeing. Burnout and cognitive decline are strongly associated with psychological distress issues as well as behavioural issues.In India, over 300 million people use smartphones, according to a 2017 study. Thus, a sizable section of the Indian populace faces the possibility of addiction. [4] Depression, which causes symptoms like mood swings, low energy, disturbed sleep, guilt, and difficulty concentrating, is the leading cause of disability globally. Tension and anxious thoughts are often associated with anxiety. When stress gets in the way of daily living and produces symptoms like exhaustion, difficulty focusing, and irritability, it becomes abnormal. [5]

Addiction to smartphones can lead to dysfunction during the day, shorter sleep durations, and poor sleep quality.The effects of sleep deprivation can be felt on the body and mind. Anxiety, depression, and suicide risk are increased in cases of poor sleep quality. Over time, insufficient or poor sleep quality may lead to musculoskeletal conditions like hand joint inflammation or cervical disc degeneration or long-term conditions like obesity, type-2 diabetes mellitus, hypertension, and cardiovascular dementia, neurodegeneration, and cardiovascular disease. [6]

The majority of young people participate in heavy multitasking with media on a smartphone. The teenagers who face greater hardship in their offline lives appear most likely to encounter the drawbacks of utilising smartphones and other electronic gadgets. Additionally, smartphones offer improved productivity in education, but overuse and unconsciousness will cause long-term sleep loss and detrimental psychological impact.[7]

The inability to control the need to use a smartphone despite its negative effects on users is known as smartphone addiction. Research has additionally been made to categorise nomophobia as a smartphone-related disorder. Even though smartphones have many benefits, their Addiction to problematic overuse has been demonstrated to have psychological as as well as the person's physical well-being. Students who are depressive and lonely tend to use smartphone more than that is required to cope up with the unpleasant feelings. [7]

Nowadays, a lot of young adults are utilising electronics within the hour prior to attempting to sleep, which obstructs the ability to go asleep and stay asleep all through the evening. Practically speaking, using a smartphone right before bed has been connected to a number of unfavourable effects. The blue Smartphone light can pierce human retinas very deeply. photoreceptors and inhibit the hormone melatonin, which regulates the pineal gland's production of the sleep and wake cycle rate, which also affects cerebral blood flow and brain electrical electromagnetic field exposure-induced activity.[7] Research studies have reported that most of the smart phone users use smart phones more at night than daytime, which is the main risk factor for decreased sleep quality mostly in the younger adults. Prolonged decrease in sleep quality may also have a direct impact on the brain function. [7] This addiction not only diminishes the quality of our sleep but also contributes to anxiety, depression and other mental health issues.

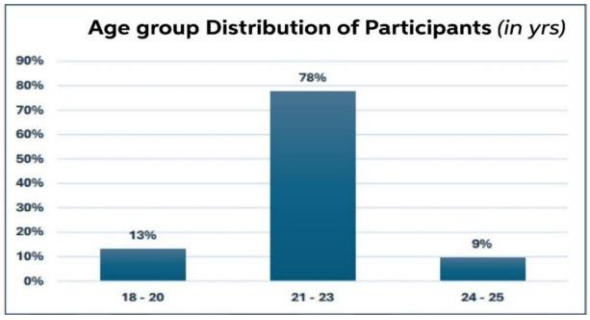
Methodology:

The present study employed an observational design to investigate the relationship between smartphone addiction, sleep quality, and psychological distress among college students. The research was conducted over a period of six months among students enrolled in various colleges in Pune, Maharashtra. The sampling technique used was convenience sampling, and based on sample size estimation considering an odds ratio of 1.65 with 80% power and 5% significance level, a total of 268 participants were included in the final analysis. Participants aged between 18 and 25 years, who had been using smartphones for a minimum duration of six months, were considered eligible. Screening for smartphone addiction was carried out using the Smartphone Addiction Scale – Short Version (SAS-SV), and only those meeting the diagnostic cut-off (≥31 for males and ≥33 for females) were recruited. Students with severe psychiatric disorders, neurological impairments, or any factors significantly altering smartphone use behavior were excluded from the study. Prior to data collection, ethical clearance was obtained from the Institutional Ethical Committee, and participants were informed about the nature of the study. Written informed consent was obtained digitally through the Google Forms platform. Demographic information such as age, gender, and duration of smartphone usage was recorded. Subsequently, participants completed the SAS-SV, the Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality, and the Kessler Psychological Distress Scale (K-10) to evaluate mental wellbeing. Data were systematically coded and entered into Microsoft Excel and later analyzed using IBM SPSS Version 26. Descriptive statistics, including mean, standard deviation, frequencies, and percentages, were used to interpret smartphone addiction levels, sleep characteristics, and psychological distress scores. All statistical findings were expressed at a 95% confidence interval with a p-value < 0.05 considered statistically significant. Results were further represented using tables and graphical illustrations for clarity and better understanding.

Results

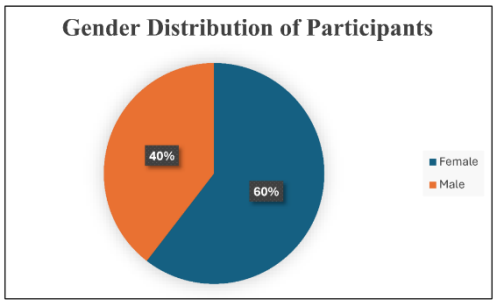
A total of 268 college students participated in the study, out of whom 60% were females and 40% were males. The mean age of the participants was within the range of early adulthood, with a majority (78%) belonging to 21–23 years, indicating a predominantly undergraduate student population. Most participants reported long-term smartphone exposure, with 98% using smartphones for more than one year and more than half having used smartphones for over five years. Daily smartphone usage was notably high, as 78% of respondents used smartphones for more than three hours per day, and a considerable 49% reported usage exceeding six hours daily. All participants met the SAS-SV criteria for smartphone addiction, confirming that the entire cohort represented an addiction-affected population. A large proportion of participants acknowledged significant interference of smartphone use in their daily functioning, including distraction during academic tasks, extended screen time beyond planned limits, neck or wrist discomfort, and complaints from peers or family about overuse. Sleep evaluation through PSQI revealed a concerning level of sleep disruption. A striking 88.4% of participants exhibited poor sleep quality, with delayed bedtimes being a prominent behavioral pattern. About 78% of students reported going to sleep after midnight, while 56% slept less than seven hours per night. Additionally, an increased sleep latency was observed, as 47% required more than 16 minutes to initiate sleep. Daytime sleepiness and reduced alertness were commonly reported, indicating functional impairment associated with sleep deprivation. Psychological distress assessment using the K-10 scale demonstrated that 80% of participants were likely to have a psychological disorder. Of these, 41.4% showed severe levels of distress, suggesting considerable emotional burden among the smartphone-addicted group. Participants frequently experienced symptoms such as nervousness, irritability, hopelessness, lack of motivation, and fatigue without an identifiable physical cause. Overall, the study findings demonstrated a strong coexistence of smartphone addiction, poor sleep quality, and heightened psychological distress within this population. The observed patterns indicate that excessive smartphone engagement may function as both a coping mechanism and a contributing source of sleep and psychological dysfunction, forming a potentially harmful behavioral cycle.

Age Distribution



Graph 1: Age-wise Distribution

Gender Distribution

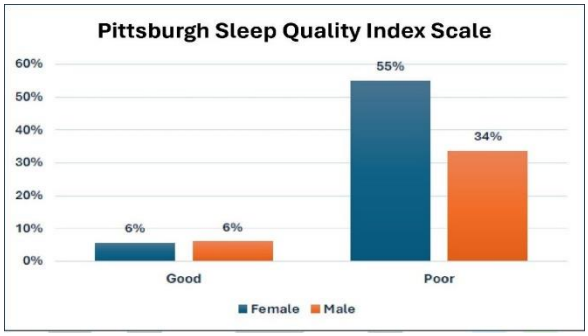


Graph 2: Gender-wise Distribution

Objective 1 : To Assess Quality Of Sleep using Pittsburgh Sleep Quality Index among College Students:

PSQI Category	Female		Male		Total	
	Freq	%	Freq	%	Freq	%
Good Sleep Quality	15	6%	16	6%	31	12%
Poor Sleep Quality	147	55%	90	34%	237	88%
Grand Total	162	60%	106	40%	268	100%

Table 1 : Interpretation of Pittsburgh Sleep Quality Index

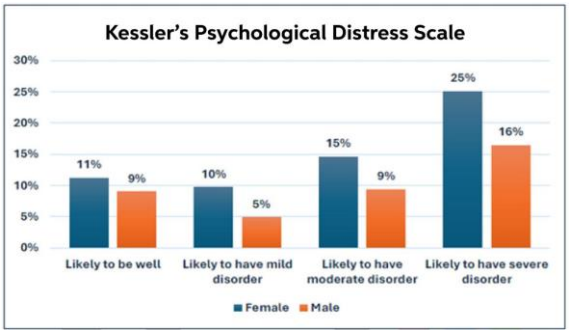


Graph 3 : Interpretation of Pittsburgh Sleep Quality Index

Objective 2- To Assess Psychological Distress using Kessler's Psychological Distress Scale among College Students:

Psychological Distress Category	Female		Male		Total	
	Freq	%	Freq	%	Freq	%
Likely to be well	30	11%	24	9%	54	20%
Likely to have mild disorder	26	10%	13	5%	39	15%
Likely to have moderate disorder	39	15%	25	9%	64	24%
Likely to have severe disorder	67	25%	44	16%	111	41%
Grand Total	162	60%	106	40%	268	100%

Table 2 : Intepretation of Kessler's Pyschological Distress Scale (K10)



Graph 4 : Intepretation of Kessler's PyscholDistressScale (K10)

Conclusion

The findings of the present study highlight a strong and consistent relationship between smartphone addiction, sleep quality, and psychological well-being among the college students. It can be concluded that high levels of smartphone addiction are significantly associated with poor sleep quality and greater psychological distress. Excessive smartphone use, particularly during nighttime, disrupts circadian rhythm through blue-light exposure, overstimulation, and delayed melatonin release, which collectively lead to impaired sleep and emotional instability. Furthermore, the cognitive overload, constant connectivity, and emotional dependency linked with smartphone addiction act as persistent stressors that heighten anxiety, depressive symptoms, and overall psychological distress.

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