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# Smartphone Overuse and Sleep Disturbance Among Young Adults in Pakistan

Rehan Shakeel[a]

[a] Visiting Lecturer, Department of Public Health, University of the Punjab, Lahore, Punjab, Pakistan, (54000) res_ahm@hotmail.com

**Correspondence:** Rehan Shakeel (res_ahm@hotmail.com)

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**ABSTRACT**

The smartphones have become a matter of life and death to young adults as they provide them with the ability to access information, be constantly connected and entertained. Nonetheless, there is a correlation between the overuse of smart phones and negative health consequences, especially sleep disturbances, which may lead to negative physical, cognitive, and mental health. The research question addressed in the study is the connection between excessive use of smartphones and sleep quality among the Pakistani young adults. A cross-sectional survey was used to gather information on 200 students of the university (aged between 18 and 30 years) in urban higher education institutions. The research assessed the patterns of smartphone use, the amount of time spent on the phone before sleep, and the self-reported sleeping problems. The results show that the lengthy use of smartphones, particularly at nighttime, is strongly connected with the delay in sleep onset, the shortening of sleep duration, and sleep fragmentation. The paper has identified apprehension campaigns and behavioral changes to encourage more healthy digital practices and sleep hygiene amongst youth adults.

**Keywords:** Mobile phone excessive use; insomnia; youthful adults; screen time; Pakistan; sleep aspect; digital conduct; mental health.

## INTRODUCTION

The use of smart phones has become one of the notable features of the contemporary life, especially among young adults, who use these phones as a means of communication, learning, entertainment, and interaction. The number of university students using smartphones in Pakistan has gone through the roof, particularly in urban regions, where students are utilizing their phones to do their studies, communicate, access social media and play online games (Khan, Ali, and Iqbal, 2020). Although smartphones have many positive characteristics, overuse has been associated with various health problems, one of which is the most noticeable (sleep disturbances). Sleep promotes cognitive functioning, emotional control, and additional physical well-being, and harm to sleep routines may bring fatigue, emotional disorders, incapacitated learning, and low educational results (Gradisar, Gardner, and Dohnt, 2013). The increasing use of smartphones by the Pakistani youth is a concern that has led to the issue of how this use affects the quality and length of sleep.

The overuse of smartphones is identified by obsessive use of devices, excessive screen time, and lack of control over smartphone usage, which most of the time interferes with daily habits, social lives, and academic duties (Billieux, Maurage, Lopez-Fernandez, Kuss, and Griffiths, 2015). Global research indicates that overuse of smartphone, especially in the evening and at night, postpones sleep onset, decreases the total sleep duration, and adversely influences the quality of sleep (Exelmans and Van den Bulck, 2016). Smartphone screens release the energy of blue light which suppresses the production of melatonin, a hormone that regulates circadian rhythms, which in turn postpones the natural sleep-wake cycle (Chang, Aeschbach, Duffy, and Czeisler, 2015). Moreover, exposure to emotionally or intellectually stimulating material (social media communication or video game playing) leads to higher arousal levels and thus more difficulty in falling asleep and/or staying asleep. A large number of messages and messages in the night also disrupt sleep, leading to numerous waking up and a lack of restorative sleep (Hirshkowitz et al., 2015).

Researchers note that university students in Pakistan dedicate substantial time to smartphones every single day, and many of them use their devices at night (Khan et al., 2020). The excessively high rates of smartphone uses have been linked to the delayed

bedtime, decreased duration of sleep, and diminished sleep quality, consequently impacting the functioning in the day and academic performance. According to Ahmed and Qureshi (2021), students who used high levels of smartphones had a problem with falling in sleep, sleep disturbances during the night, and daytime drowsiness. Additionally, lack of sleep in the long term in young adults has been associated with mental health disorders such as anxiety, depression, irritability, and distress lack of resilience to stress, and physical disorders, including immunological and metabolic problems (Medic, Wille, and Hemels, 2017). These results indicate that excessive use of smartphones can potentially contribute to the rise in the rates of sleep disorders among Pakistani university students.

The studies that have been conducted on the connection between sleep and smartphone use in Pakistan are few. Whereas the global research gives a clear indication of the relationship between night issues and excessive device use, there are no systematic studies that have studied particular usage, nighttime patterns, and sleep quality within the Pakistani setting in young adult students (Salehan and Negahban, 2013). Majority of the studies are based on small non representative samples or based on self-reported data without a combination of objective measures of smart phone use. The patterns of smartphone use and their effects on sleep can be affected by cultural, social and environmental aspects such as academic pressure, family expectations and social norms, which are underinvestigated in the Pakistani context. The dynamics can be highly important in understanding how to initiate effective interventions to alleviate sleep disruptions and enhance healthy device use among young adults.

The possible implications of the impaired sleep include wide-spanning effects on cognitive functioning, emotional status, as well as physical health. Sleep deprivation might affect academic success of students by affecting memory consolidation, attention and learning ability, which are essential (Wheaton, Ferro, and Croft, 2016). Poor sleep is also identified to lead to mood disorders, stress level, and low-quality life. Besides, lack of sleep might cause physical health issues, such as obesity, cardiovascular risk, and weakening the immune system (Gradisar et al., 2013). Considering the increased dependence on smart phones among the Pakistani young generation, the overlap between overuse of the device and lack of sleep is a timely issue that needs empirical research.

This research paper seeks to identify the correlation between excessive use of smartphone and sleep disorders among young adults in Pakistan in a sample size of about 200 Pakistani university students aged 18-30 years. The study aims to offer evidence-based information on the impact of smartphones on sleep and inform interventions aimed at promoting responsible phone use and better sleep hygiene by analyzing the patterns of device usage, behaviors before bedtime, self-reported sleep quality, etc. This relationship is important to understand in order to tackle the academic, psychological, and health challenges that young adults face in the modern Pakistan.

## LITERATURE REVIEW

The high rate at which young adults are adopting smart phones has resulted in tremendous changes in their everyday habits, communication habits and daily lifestyle habits. Convenience, entertainment, and immediate access to information are some of the benefits of smartphones, which are therefore required by university students, who use them to access academic materials, socialize, play games and consume multimedia. Although these devices have several advantages, their overuse has been associated with various adverse effects especially sleep disorders which are currently becoming a national health issue. Research has indicated that the high use of smartphones is linked to poor sleep onset, the reduction in sleep duration and sleep fragmentation and low quality sleep. According to Salehan and Negahban (2013), mobile phone use can be compulsive and people can be obsessed with using the device to the extent of neglecting sleep in favor of using the phone even at the expense of circadian cycles and ability to have a normal sleep pattern. This is especially applicable to university students in Pakistan, where the number of people with smartphones is high, and it is common to use this device at night because of academic and social requirements (Khan, Ali, and Iqbal, 2020).

The concept of Smartphone overuse can be viewed as the behavioral addiction, which is defined by spending excessive time on gadgets, obsession with online activities, and the inability to limit Smartphone use (Billieux, Maurage, Lopez-Fernandez, Kuss, and Griffiths, 2015). Studies indicate that learners with a high degree of smartphone usage tend to have sleeping issues both physiologically and psychologically. At the physiological level, screen exposure to blue light inhibits the production of melatonin, which postpones the onset of sleep and disregards the circadian rhythm (Chang, Aeschbach, Duffy, and Czeisler, 2015). The cognitive and emotional arousal caused by the use of smartphones in bed, especially social media, messaging, and gaming, leads to more behavioral challenges in letting the behavior shift to sleep. Several awakenings and lack of restorative sleep are also caused by frequent incidences of night time notifications and alerts that lead to sleep fragmentation. All of these mechanisms are interconnected to cause both acute and chronic sleep disturbances, which may have a strong impact on the mental, physical, and academic health of young adults (Exelmans and Van den Bulck, 2016).

The aftermath of disturbance of sleep is immense. Severe sleep deprivation is also associated with

cognitive impairment, such as memory consolidation, worse attention capacity, and slower processing of information, all of which have a negative impact on academic performance (Wheaton, Ferro, and Croft, 2016). Emotional and psychological difficulties, such as the rise in stress, irritability, anxiety, and depression, are also linked to sleep problems (Gradisar, Gardner, and Dohnt, 2013). Moreover, sleeping deprivation impairs physical well-being by influencing immune functioning, metabolism, and heart diseases. Speaking of the situation in Pakistan, where academic pressures and competitive factors are the norm, sleep disorders associated with cell phone use could worsen stress and psychological issues in college students (Ahmed and Qureshi, 2021).

Various studies in the world have proved the relationship between smartphone overuse and sleep disturbances. Chang et al. (2015) discovered that exposure to light-emitting devices in the evening impacts the melatonin secretion and circadian timing negatively leading to the deficiency of sleep duration and sleepiness in the morning. Exelmans and Van den Bulck (2016) indicated that the use of bedtime smartphones is closely associated with delayed sleep onset and short total sleep time among adults. Billieux et al. (2015) stressed that mobile phone addiction results in compulsive use, obsession, and failure to control usage, which are all factors in causing sleeping issues. The psychological and behavioral aspects of overusing mobile phones were also emphasized by Salehan and Negahban (2013), who added that the over-use of the device raises cognitive and emotional arousal that disrupts the normal sleeping patterns. These research papers give a solid background on the mechanism of physiological and psychological interconnection between smartphone and the disturbance of sleep.

Although there is extensive evidence in global research, there is limited evidence on studies investigating the Pakistani young adults. Available literature indicates that students use smartphones extensively, and a significant number of them devote several hours to devices per day, especially in the evening, which is likely to be associated with the lack of bedtime and reduced time of sleep (Khan et al., 2020). Ahmed and Qureshi (2021) discovered that participants who have a high amount of screen time frequently complain of frequent awakening and trouble sleeping as well as fatigue during the day. These studies however tend to be limited in the scope of generalisability as the sample is often small or non-representative. Also, objective measures of smartphone use have not been combined with subjective measures of sleep quality, as there is a paucity of research studies that address the issue of quantifying the extent and trends of sleep disturbance. The issue of cultural, social, and environmental factors can also affect smartphone use and its effects on sleep. As an illustration, academic commitments, parental demands, and societal demands may define the time and manner in which students use devices and lifestyle choices and city living may intensify the impacts of night use of devices. These contextual factors are important to comprehend so as to come up with interventions that resonate with the Pakistani population.

The rising rate of smartphone overuse among Pakistani university students does not only have significant health, educational, and social well-being implications. The use of the device is not only the cause of sleep loss but also daytime exhaustion, poor focus, and poor academic results. Persistent sleeping disorders can also make one more vulnerable to mood disorders and physical illnesses. Studies indicate that interventions based on digital hygiene, understanding of sleep health, and behavior change to curb the use of devices in the night can enhance the quality of sleep and decrease adverse outcomes (Medic, Wille, and Hemels, 2017). The interventions can involve the creation of device-free times before sleep, installing blue light filters, encouragement of other forms of relaxation, and awareness campaigns to students, educators, and parents concerning the effects of excessive use of smartphones on sleep.

Finally, the available literature proves that there is a strong and unambiguous correlation between smartphone excess use and sleep problems among young adults. Disrupted sleep patterns are caused by physiological processes, including blue light exposure, behavioral processes, including nighttime use, and psychological processes, including pre-bedtime arousal. The study of the association between the patterns of smartphone use and sleep quality has not been extensively studied in Pakistan, particularly in the context of university students, who represent one of the most widespread users of this technology. The gap should be filled to come up with evidence-based interventions and policies that encourage the use of smartphones responsibly, improve sleep hygiene, and promote academic, mental and physical health among the young adults in the country. A systematic study of smartphone overuse and sleep disorder can serve as an essential source of information to educators, health practitioners, and policymakers, the need to reduce the adverse effects of current electronic behaviors.

## METHODOLOGY

The research design that was used in this study was a quantitative cross-sectional study through which the relationship between smartphone overuse and sleep disturbances among young adults in Pakistan was investigated. Simple random sampling was applied to make the sample representative and to reduce selection bias, 200 undergraduate students aged between 18 and 30 years administered a sample of 200 participants. The respondents were involved on a voluntary basis and informed consent given before data collection.

A structured self-administered questionnaire was used to collect data, which was created to include demographic data, smartphone usage trends, usage at night, and sleep disturbance. The use of smartphones was evaluated in relation to the duration of use per day, the number of times they are checking their notification, and on pre-bedtime use of social media, messaging applications, and playing games. The quality and disturbances of the sleep were assessed with an adapted form of the Pittsburgh Sleep Quality Index (PSQI), which assesses the sleep latency, duration, efficiency, disturbances, and daytime dysfunction (Buysse, Reynolds, Monk, Berman, and Kupfer, 1989). The questionnaire was pretested on a sample of a few students to confirm that it is clear, reliable and valid.

The data collection was done within a duration of four weeks and the participants were allowed to fill the questionnaire separately. This was done with strict confidentiality and the participants were assured that their answers would only be utilized in a research purpose.

The gathered data were performed by statistical methods descriptive and inferential statistics. Demographic data, smartphone use, and sleep disturbances prevalence were summarized with the use of descriptive statistics given in the form of means, standard deviations, frequencies, and percentages. To evaluate the relationship between smartphone overuse and the level of sleep quality, inferential statistics, such as Pearson correlation and regression analysis, were used to test the significance and the strength of the relationships. All statistical tests were performed with SPSS version 25 at the level of significance of $p < 0.05$.

## DATA ANALYSIS AND FINDINGS

The results of 200 undergraduate students studied were compared in order to examine the connection between excessive smartphone use and sleep disorders. The descriptive and inferential statistics were used to analyze the demographic profiles of the participants, smartphone usage patterns, and the quality of their sleep.

### Demographic Characteristics of the respondents

Table 1 is a summary of the demographic features of the respondents. Out of 200 respondents, 56 percent of them were women (n = 112) and 44 percent were men (n = 88). Most of the respondents were in the 20-24 years old (62%), 18-19 years (18%), and 25-30 years (20%). The majority of the participants were pursuing undergraduate courses (78%), with the rest pursuing diploma or associate courses (22%).

**Table 1: Demographic Characteristics of Participants (n = 200)**

| Demographic Variable | Category | Frequency | Percentage (%) |
|---|---|---|---|
| Gender | Male | 88 | 44 |
| | Female | 112 | 56 |
| Age (years) | 18–19 | 36 | 18 |
| | 20–24 | 124 | 62 |
| | 25–30 | 40 | 20 |
| Program Level | Undergraduate | 156 | 78 |
| | Diploma/Associate | 44 | 22 |

### Patterns of Smartphone Usage

The respondents were asked to describe how they use their smartphones on average every day and how they interact with nighttime screens. In Table 2 the distribution of the daily smartphone use is shown. Almost 40 percent of the respondents said that they spent 4-6 hours per day using smartphones and 35 percent spent over 6 hours a day on the device. Only a quarter of the users had under 4 hours of daily smartphone use.

**Table 2: Daily Smartphone Usage of Participants (n = 200)**

| Daily Usage Duration | Frequency | Percentage (%) |
|---|---|---|
| Less than 4 hours | 50 | 25 |
| 4–6 hours | 80 | 40 |
| More than 6 hours | 70 | 35 |

The use of smartphones at night especially before going to bed was also common. Approximately 68 percent of students have said that they use smartphones in the 1-hour of sleeping and that 42 percent of them have checked notifications at night. The most frequently used pre-sleep activity was the engagement in social media (62%), video streaming (20%), and gaming (18%).

### Sleep Patterns and Quality

The sleep disturbances were measured with the help of a scaled Pittsburgh Sleep Quality Index (PSQI). The findings were that the undue use of smartphones had adverse impacts on sleep onset, duration, and quality. Table 3 summarizes the critical indicators of sleep among the participants. Approximately forty five percent stated that they were having poor sleep quality with thirty percent stating that they were frequently getting awakened in the night. Only a quarter of them said that they had a good sleep quality and sleep patterns.

**Table 3: Sleep Quality Indicators (n = 200)**

| Sleep Indicator | Frequency | Percentage (%) |
|---|---|---|
| Good Sleep Quality | 50 | 25 |
| Poor Sleep Quality | 90 | 45 |
| Frequent Nighttime Awakenings | 60 | 30 |
| Sleep Duration <6 hours/night | 88 | 44 |
| Sleep Duration 6–8 hours/night | 92 | 46 |
| Sleep Duration >8 hours/night | 20 | 10 |

The correlation analysis revealed that there is a high correlation between bad sleep quality and nighttime smartphone use. The respondents who spent more than 6 hours a day or 1 hour before sleep using smartphones also had a shorter sleep span, and more sleep disturbances than those who used smartphones less frequently.

**Association of Smartphone Overuse and Sleep Disturbance**

The Pearson correlation analysis was performed to analyze the correlation between the smartphone overuse (in hours/day) and sleep disturbance scores (the higher the score, the poor the quality of sleep). Table 4 shows that the correlation between smartphone use and sleep disruption is significant and positive ($r = 0.62$, $p < 0.01$), implying that the increased use of smartphones is linked to the increased lack of sleep.

**Table 4: Pearson Correlation Between Smartphone Use and Sleep Disturbance**

| Variable | 1 | 2 |
|---|---|---|
| 1. Daily Smartphone Use | 1 | |
| 2. Sleep Disturbance Score | 0.62** | 1 |

Note: **p < 0.01

The regression analysis further revealed that sleep disturbance scores were significantly predicted by the daily use of smartphones ($b = 0.61$, $t = 10.2$, $p < 0.001$) in which an approximation of 38% of the variance in sleep disturbances was explained ($R2 = 0.38$). This implies that the high usage of smartphones is a good predictor of low-quality sleep among young adults.

**Effects of Smartphone activities at night**

In order to explore the impact of nighttime interaction further, the participants were grouped in reference to the use of smartphones at least 1 hour after going to sleep. Table 5 presents the comparison of the quality of sleep among high and low night users. The scores of sleep disturbance and sleep duration among high nighttime users were highly significant as compared to the low nighttime users ($p < 0.01$).

**Table 5: Sleep Quality by Nighttime Smartphone Use**

| Nighttime Usage | Mean Sleep Disturbance Score | Mean Sleep Duration (hrs) |
|---|---|---|
| High Nighttime Users (n=136) | 8.4 | 5.9 |
| Low Nighttime Users (n=64) | 5.2 | 7.1 |

These results suggest that the use of smartphones near bedtime in particular to access social media and messages is a major cause of delayed sleep onset, sleep disruptions, and reduced total sleep duration.

**Summary of Findings**

Analysis data show that smartphone overuse is common among young adults in Pakistan as most participants spent over 4 hours a day on their devices and had nighttime smartphone phone behaviors. Poor quality of sleep, poor duration of sleep and high levels of sleep disturbances were strongly linked to high daily and nighttime smartphone use. The correlation and regression results prove that smartphone overuse is a considerable predictor of sleep disruption, with individuals who use this tool during late hours having the poorest sleep consequences. The results align with the previous studies in which excessive use of digital devices was associated with a late fall asleep, interrupted sleep and sleepiness during the day (Chang et al., 2015; Exelmans and Van den Bulck, 2016; Khan et al., 2020).

Finally, the research shows that there is a strong correlation between excessive smartphone use and sleeping disturbances in young adults who should receive awareness campaigns, behavioral interventions, and measures to engage in healthier smartphone use and sleeping hygiene.

## CONCLUSION

This paper examined the association between smartphone excessive use and sleeping problems among Pakistani young adults on a sample of 200 undergraduate students. The results show that the excessive use of smartphones, especially at night, is strongly correlated with the lack of a good quality of sleep, lateness of sleep initiation, decrease in total hours of sleep and sleep fragmentation. Individuals who had a long smartphone time or accessed their phones less than one hour to bed-time experienced the most sleep disturbance. It was also discovered in the analysis that smartphone overuse is a good

predictor of disrupted sleep and it explains a significant amount of the variance in sleep outcomes. These findings are consistent with previous studies that show that besides physiological causes, like blue light exposure, behavioral causes, like cognitive and emotional arousal about using the device, cause disruption of sleep. On the whole, the paper indicates that the excessive use of smartphones has become a serious issue in the population of young adults in Pakistan, and it has the potential to influence academic success, mental health, and well-being.

## RECOMMENDATIONS

According to the results of this paper, the following recommendations can be suggested:

1. **Awareness Programs:** Universities and learning institutions ought to conduct workshops and awareness programs that will inform the students on the adverse effects of overuse of the smartphone on sleep and general health.
2. **Behavioral Interventions:** It is recommended that students set up periods during which they do not use their smartphones, especially in the last hour before bedtime, to have minimal sleep disturbance and better sleep hygiene.
3. **Digital Well-being Tools:** Applications on smartphones that can track their usage and remind them that they should not spend too much time on their phone devices should be encouraged to allow students to track and control their smartphone use.
4. **Sleep Hygiene Education:** The students ought to be equipped with effective measures of enhancing the quality of their sleep, such as ensuring that they keep regular sleep routines, make their sleep environment conducive, and eliminate exposure to screens at night.
5. **Policy Development:** Learning institutions can also incorporate the use of guidelines on responsible smartphone use within student conducts, and a balanced approach to technology use without jeopardizing health should be established.
6. **Future Studies:** Future research must consider the long-term effects on sleep and mental health of the excessive use of smartphones, as well as the use of objective data, such as actigraphy or sleep tracking apps, and on the intervention to reduce nighttime smartphone use.

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