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## The Impact of Overuse of Cell Phones on Physical Activity and Sleep Quality Among Undergraduate Students of Ncs University System Peshawar: A Cross-Sectional Study

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### ABSTRACT

To find the impact of overuse of cell phones on physical activity and sleep Quality among undergraduate students of NCS University System, Peshawar. The study design was an Analytical Cross-Sectional Study, which was conducted in NCS University System, Peshawar. The sample size was 242, calculated with Rao soft sample size calculator. International Physical Activity Questionnaire, PITTSBURGH SLEEP QUALITY INDEX (PSQI) scale and smartphone addiction scale were used for data collection. Total of 242 participants in the study, out of which 52.48% (127 participants) were male and 47.52% (115 participants) were female. The International Physical Activity Questionnaire (IPAQ) are results of those who participated in this study. From the 242 participants, 97.93% had engaged in low physical activity, followed by 2.07% of participants who engaged in moderate activity. The negative effects of smartphone overuse on physical activity and sleep quality. Our findings underscore the importance of addressing smartphone addiction as part of health promotion strategies, particularly among university students. Interventions to promote healthier smartphone habits, encourage physical activity, and improve sleep hygiene could help mitigate the adverse effects of excessive smartphone use.

### INTRODUCTION

The presence of technology, particularly mobile devices like smartphones, has become increasingly dominant in the contemporary world. These gadgets, with their transformative capabilities, have made communication, information access, and entertainment-seeking more convenient than ever, becoming indispensable in our daily lives. Despite the undeniable advantages of smartphone technology, there is a growing concern about its potential negative impact on various aspects of health, particularly physical activity and sleep quality (Dudić *et al.*).

Regular exercise and sufficient sleep are not just important; they are crucial for our overall well-being. The World Health Organization (WHO) in 2020 recommended that adults should engage in a minimum of 150 minutes of moderate-intensity physical activity per week for optimal health (Papaioannou *et al.*, 2020). Similarly, the American Academy of Sleep Medicine in 2017 advised that adults should aim for 7-9 hours of sleep each night to promote cognitive function, emotional well-being, and physical health (Sateia *et al.*, 2017). The decline in physical activity and sleep quality can be partly attributed to lifestyle changes driven by the increasing use of digital devices, particularly smartphones. These changes are a consequence of smartphones evolving from simple communication tools into powerful multi-functional devices, leading to their widespread use in various aspects of daily life (Basner & Dinges, 2018).

According to Generation (2017), adults now spend an average of over five hours per day on smartphones, with a significant portion of this usage occurring in the evening and late-night hours. This prolonged and late-night smartphone use raises concerns about its potential impact on health behaviours such as physical activity and sleep, underscoring the urgent need for a deeper understanding and awareness of the consequences of excessive smartphone use (a Generation, 2017).

Increasing the level of physical activity is beneficial in young adulthood as it may help to lower the risk of cardiovascular events in later life. The recommended guidelines that are suggested for physical activity levels throughout a lifetime may be difficult; increasing physical activity and achieving that as much as possible are encouraged (Huang *et al.*, 2024).

It is also necessary to evaluate the alternative side. Physical inactivity is defined as when you don't move your body for long periods of time, and as a result, you don't get the recommended level of regular physical activity. Physical inactivity, based on the recommendations of the World Health Organization (WHO), is defined as failure to accumulate at least 150 minutes of moderate physical activity, 75 minutes of vigorous physical activity, or a combination of both intensities per week (Bull *et al.*, 2020).

Physical activity is essential for maintaining cardiovascular health and metabolic function, and regular physical

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activity is crucial for maintaining overall well-being, as it plays a significant role in reducing the risk of chronic conditions such as obesity, diabetes, and heart disease. Additionally, physical activity has been shown to have positive effects on mental health by decreasing symptoms of anxiety and depression (Activity & Team, 2020). A sedentary lifestyle is characterized by prolonged periods of inactivity, often involving sitting or lying down with minimal energy expenditure. This type of lifestyle has been associated with a myriad of adverse health outcomes, including obesity, cardiovascular disease, and premature mortality (WHO, 2012). Another aspect is the influence of smartphone use on motivation and energy levels. Excessive smartphone use, especially through social media and gaming, has been linked to increased feelings of fatigue and decreased motivation to engage in physical activity (Menhas *et al.*, 2021).

## MATERIALS AND METHODS

A cross-sectional study was carried out to investigate the impact of smartphone overuse on physical activity and sleep quality. The research study lasted six months. Every part of the ethical issues associated to the research study was comprehensively reviewed with the responsible representative of Institute. Verbal consent was taken from the study participants and the agreeing students filled the standardized and validated questionnaire. The sample size calculated for the research study was 242. Convenience sampling technique was used in this study. Data was analyzed by using software SPSS 25.

## RESULTS AND DISCUSSION

In this study, out of 242 participants, 52.48% (127 participants) were males and 47.52% (115 participants) were females. Among all participants, 36 were classified as engaging sometimes in smartphone, including 6 in the disagree range, 10 in the weakly disagree range, 12 in the weakly agree range, 6 in the agree range and 2 in the strongly agree range. Additionally, 183 participants as engaging often in smartphone, with 11 in the disagree range, 44 in the weakly disagree range, 58 in the weakly agree range, 56 in the agree range and 14 in the strongly agree range. Furthermore, 22 individuals were categorized as engaging in smartphones almost always, with 1 in the disagree range, 6 in the weakly disagree range, 7 in the weakly agree range, 6 in the agree range, and 2 in the strongly agree range.

Furthermore, among the total  $n=242$  participants, 236 individuals were linked to engaging in low physical activity, with 17 in the disagree range, 59 in the weakly disagree range, 77 in the weakly agree range, 65 in the agree range, and 18 in strongly agree range. Furthermore, 5 individuals were classified in the category of moderate physical activity, with 1 in the disagree range, 1 in the weakly disagree range, 0 in the weakly agree range, 3 in the agree range, and 0 in the strongly agree range.

## Discussion

The current study included 242 people with a standard

age of 1.9 years and a standard deviation of 0.912. The gender split was 52.48% male and 47.52% female. IPAQ scores revealed that 97.93% of people participated in low physical activities and 2.07% in moderate physical activities.

This study aimed to investigate the impact of excessive smartphone use on physical activity and sleep quality among university students. Our findings revealed that high levels of smartphone use were linked to decreased physical activity and poorer sleep quality. These results add to the growing body of research highlighting the negative consequences of smartphone addiction, particularly in academic settings, where young adults are especially susceptible to these behavioural patterns.

The negative relationship between smartphone and physical activity observed in this study is consistent with several studies that have explored the effects of excessive smartphone use on physical activity. For example, Firth *et al.* (Ahmed *et al.*, 2023) found that increased screen time was associated with decreased physical activity and higher levels of sedentary behaviour among university students. Similar findings were reported by Tiedemann *et al.* (Tidman & Skotzke, 2020), who suggested that smartphone overuse and the time spent sitting while using smartphones are linked to physical inactivity and a higher risk of cardiovascular diseases. Furthermore, Villagrán *et al.* (Harithasan *et al.*, 2022) demonstrated that students with higher smartphone use were likelier to exhibit lower physical activity levels and poorer overall health, corroborating our findings that smartphone addiction can be a barrier to maintaining an active lifestyle.

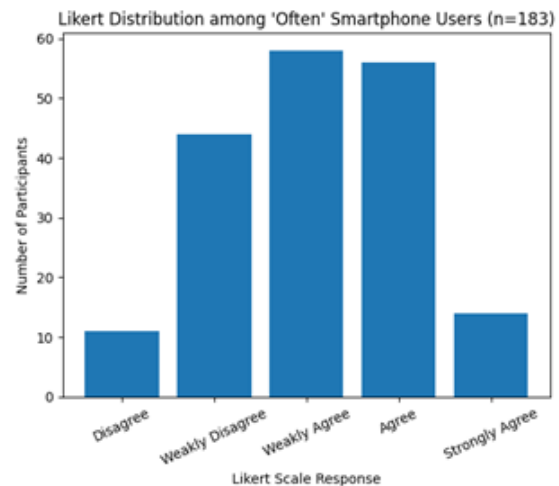
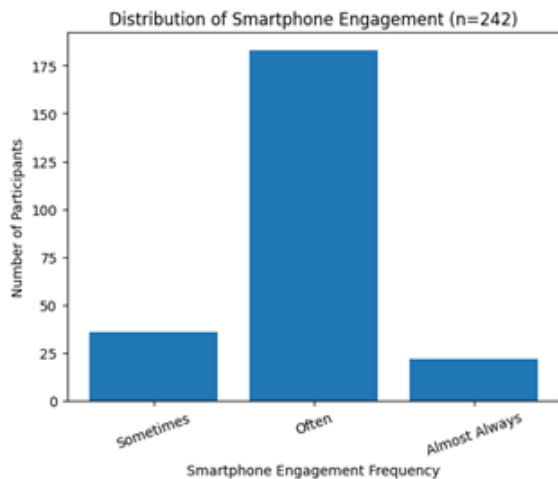
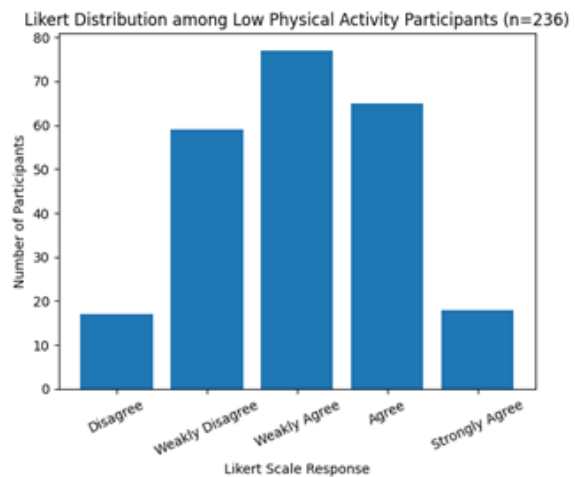
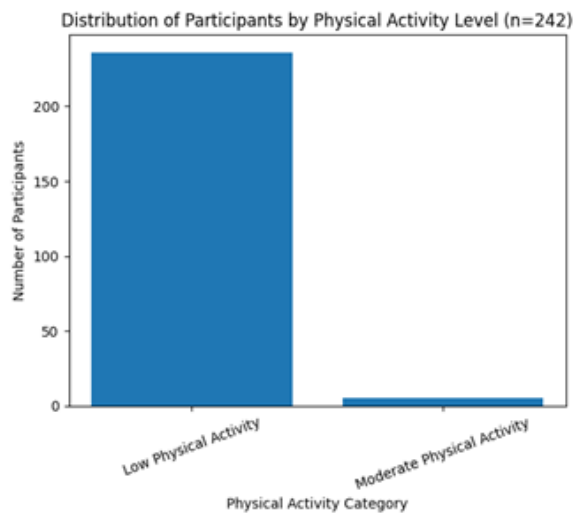
Despite the strong support for our findings in the literature, some studies have produced different results. For example, a study by Gopinath *et al.* (Wang *et al.*, 2020) found no significant association between smartphone use and physical activity levels among young adults. Their study suggested that smartphone use could coexist with physical activity, especially for fitness tracking or engaging with physical activity-related content. Similarly, Park *et al.* (Leow *et al.*, 2023) studied smartphone use and sleep quality. Still, they did not find a significant relationship, suggesting that factors such as stress or anxiety may be more prominent in affecting sleep quality than smartphone use alone. These discrepancies may be due to differences in study designs, population characteristics, or the specific types of smartphone use considered in the studies.

## Limitation

1. This study had some limitations. The cross-sectional design limited our ability to establish causality between smartphone overuse, physical activity, and sleep quality. While we can infer associations, we cannot determine whether smartphone addiction causes reduced physical activity and poor sleep or whether these factors influence smartphone use. Longitudinal studies would be needed to examine the long-term effects of smartphone overuse on health outcomes.

2. Additionally, the self-reported nature of the data collection, particularly for smartphone use, physical activity, and sleep quality, may introduce biases such as recall bias or social desirability bias. Participants may have overreported or underreported their smartphone use or physical activity levels. Objective measurements, such as accelerometers to measure physical activity or actigraphy to monitor sleep,

could provide more accurate data.  
 3. The sample size and the convenience sampling technique also limit the generalizability of the results. The participants in this study were drawn from a single university and may not represent the broader university student population. Future studies could include more diverse populations, including students from different regions and universities, to increase



4. the generalizability of the findings.

**CONCLUSION**

This study contributes to the growing body of research highlighting the negative effects of smartphone overuse on physical activity and sleep quality. Our findings underscore the importance of addressing smartphone addiction as part of health promotion strategies, particularly among university students. Interventions to promote healthier smartphone habits, encourage physical

activity, and improve sleep hygiene could help mitigate the adverse effects of excessive smartphone use. Further research, particularly longitudinal studies, is needed to understand the long-term consequences of smartphone overuse and to develop effective strategies to promote better health outcomes in the digital age.

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