Impacts of Smartphone Usage on the Digital Wellbeing of University Students: A Systematic Review

Tarjan Das[1], Dr. Asomi Chaliha[2]

[1]Research Scholar, Department of Education, Dibrugarh University.
[2]Associate Professor, Department of Education, Dibrugarh University.

Abstract

University students' extensive smartphone use in recent years has sparked increased worries about the impact of this technology on digital wellbeing, a multifaceted term that includes physical, social, academic, and emotional health in digital environments. This systematic review looks at the body of research on how smartphone use affects university students' digital wellbeing with the goal of identifying key trends, methodological limitations, and gaps in research. The analysis synthesizes results from empirical research on problematic smartphone use (PSU), which consistently shows links to psychological distress, poorer academic achievement, poorer sleep, and a decreased sense of social connectedness. Research revealed that emotional and psychological impacts, such as anxiety, stress, and depressive symptoms, are the most frequently studied dimensions. Academic consequences include lower GPA and diminished classroom engagement, particularly when smartphones are used for non-academic purposes. Although social and physical welfare receive less attention, they exhibit trends of loneliness, a drop in empathy, and health problems like sleep disorders and decreased physical activity. Additionally, the review identifies several methodological gaps, including a dependence on self-reported data and varying definitions of digital wellbeing. While previous research has focused and explored related issues in various populations, a systematic focus on university students remains limited. This review fills that gap by offering a holistic synthesis, outlining the complex relationship between smartphone behaviours and university students' wellbeing. In order to promote better digital habits in academic settings, the findings inform future interventions, digital literacy initiatives, and policy-making. They also emphasise the importance of balanced smartphone use.

Keywords: digital wellbeing, university students, smartphone addiction, psychological wellbeing, academic performance, screen time, social engagement

Introduction

Smartphones are become essential instruments for communication, education, and entertainment in the current digital era. Their many uses, which include academic research and instant messaging, have made them ingrained in university students' daily lives. According to Pew Internet (2018), young adults aged 18–29, many of whom are university students, use smartphones for an average of five hours daily and check them over 150 times a day. This highlight worries about misuse and its effects, even though it also shows a growing reliance on digital technologies for daily tasks. The inability to regulate smartphone

behaviour is specifically referred to as problematic smartphone usage (PSU), and which can lead to disruptions in the social, psychological, physical, and academic domains. Furthermore, some research revealed the detrimental effects of excessive technology use. Particularly, smartphones have been shown to be a source of distraction, and excessive use of them can negatively impact social interaction and mental health. Moreover, Smartphone's assist as a gateway for a variety of mobile applications that can result in addictive behaviours (Ding et al., 2016). As the digital footprint of students continues to expand, the concept of digital wellbeing—the balance between healthy technology use and personal wellbeing—has gained prominence among researchers and educators alike.

Digital Wellbeing:

The growing body of literature highlighting the probable adverse effects of digital consumption on daily activities has led to the rise of a new concept known as digital wellbeing, which is recognized by both researchers and practitioners. Burr et al. (2020) offer a broad perspective, defining digital wellbeing as "the impact of digital technologies on what it means to live a life that is good for a human being in an information society." Complementing this, Gui et al. (2017) view digital wellbeing as a "state where subjective wellbeing is maintained in an environment characterized by digital communication overabundance." Zooming in on individual interactions with technology, Widdicks et al. (2017) describe digital wellbeing as "a positive feeling associated with the use of technology, striven by maintaining a balance between our 'real' and 'online' lives." This sense of personal satisfaction and alignment is echoed by Google (Goofgle, n.d), which defines digital wellbeing as "a state of satisfaction attained when digital technology aligns with and bolsters personal intentions." On the other hand, Vanden Abeele (2021) defines it as "a subjective individual experience of optimal balance between the benefits and drawbacks obtained from mobile connectivity."

Research Questions:

1. What are the key dimensions of digital wellbeing impact on smartphone usage among university students?
2. In what ways does problematic smartphone usage impact academic, psychological, physical, and social wellbeing?
3. What are the primary methodological trends and limitations in current research on smartphone use and student wellbeing?

Research Objectives:

1. To identify and analyse the key dimensions of digital wellbeing that impact on smartphone usage among university students.
2. To examine the impact of problematic smartphone usage on academic, psychological, physical, and social wellbeing of university students.
3. To explore the primary methodological approaches and limitations in current research examining the relationship between smartphone use and student wellbeing.

Methodology:

This study adopts a qualitative research design based on secondary data analysis to explore the impact of smartphone usage on the digital wellbeing of university students by identifying key dimensions of digital

wellbeing, examining the effects of problematic smartphone use on academic, psychological, physical, and social wellbeing, and analysing the primary methodological approaches and limitations in current research on this topic. Data is based on peer-reviewed journal articles, credible media reports, and institutional publications, excluding meta-analyses, literature reviews, and non-authenticated sources. A systematic search using keywords related to smartphone use and student wellbeing will guide the selection of relevant studies. The collected data will be analysed through content analysis to identify key themes across academic, psychological, physical, and social wellbeing domains, as well as to highlight methodological trends and gaps in existing research. Ethical considerations are minimal, as the study uses publicly available data with proper citation and attribution.

Review of Related Literature

Problematic smartphone usage (PSU) has turn out to be a central concern in the discussion of digital wellbeing, particularly among university students. Busch and McCarthy (2021) define PSU as a compulsive need to interact with smartphones in ways that interfere with daily life. This PSU behavioural pattern is closely associated with psychological issues such as anxiety and depression, as shown in studies by Elhai et al. (2017). In order to moderate this habit, self-regulation is essential. Davazdahemami et al. (2016) highlight that those who possess greater self-control are less prone to engage in compulsive smartphone practices. Time of use also important; studies by Lee et al. (2014) and Mavuso et al. (2020) indicate that early and late-night use, particularly when connected to social media and messaging apps, greatly increases the risk of addiction (Urmanov & Hoyoung, 2021). Particularly at risk are students who use entertainment apps like mobile gaming and video streaming for extended periods of time (Lin & Chiang, 2017; Hao et al., 2019).

The academic consequences of PSU are widely reported. According to Ahmed et al. (2023), students' CGPA and excessive app use—especially social and entertainment apps—were negatively correlated. Samaha and Hawi (2016) have demonstrated a connection between smartphone addiction and low academic performance. However, some categories of smartphone apps, including those for productivity or e-reading, were linked to better academic results (Ahmed et al., 2023), indicating that not all smartphone use is bad for learning.

Another area where PSU has a major impact is psychological wellbeing. Several studies have found that students who rely deeply on their smartphones have higher levels of stress, anxiety, and depression (Rozgonjuk et al., 2018; Zhao & Hounnaklang, 2021). According to Kushlev et al. (2016), symptoms have included emotional exhaustion, sleep disturbance, technological stress, and even behaviours resembling those of ADHD. When students are unable to access their smartphones, their emotional attachment to smartphones also leads to feelings of guilt and distress (Subramaniam et al., 2020; Funk et al., 2021).

Moreover, PSU is associated with negative outcomes of physical wellness of university students such as poor sleep quality, sedentary behaviour, and unhealthy eating habits often linked to multitasking with smartphones (Ding et al., 2021; Kononova et al., 2018). In terms of social wellbeing, continued smartphone use is correlated with reduced face-to-face interaction, increased loneliness, and lower levels of empathy (Hamida et al., 2021). Although some argue that digital tools foster connectedness, excessive usage often undermines meaningful interpersonal relationships.

A deeper conceptual exploration of digital wellbeing was undertaken by Abeele (2021) offered a dynamic definition that emphasises the subjective aspect of wellbeing as a balance between the advantages and disadvantages of mobile connectivity. Digital wellness, according to Abeele, should not be seen as a static

condition but rather as a dynamic experience that is influenced by context and personal preferences. In a related study, Giraldo-Luque and Fernández-Rovira (2020) examined the struggle for human attention in the digital economy. Their research, grounded in neuropsychology and economics, revealed how the addictive design of social media platforms manipulates user attention and emotion, resulting in psychological, social, and physical development challenges for young users.

Almourad et al. (2021) examined the function of digital wellbeing apps such as SPACE and Google Digital Wellbeing (GDW) from a solutions-oriented standpoint. According to their findings, the usefulness of these apps primarily depends on user approval and design quality, even though they can raise awareness and aid in screen time management. The study recommended that future apps be based on user-centred design and behavioural change theory after identifying both potential and obstacles in enhancing the impact and design of these tools using thematic analysis of user feedback.

By examining the relationships between particular behaviours (messaging, gaming, and reading/posting content) and anxiety and depression among college students from Spain, the United States, and Colombia, Panova (2019) brought a cross-cultural perspective to the study of smartphone use. The results demonstrated that whereas usage patterns were comparable across nations, their psychological effects differed. In Colombia, for example, gaming seemed protective, whereas in the United States, it associated with increased anxiety. These variations highlight how crucial cultural context is to comprehending the connection between smartphone use and mental health.

Furthermore, Abeele and Nguyen (2021) presented important distinctions in the conceptualisation of digital wellbeing, highlighting two main themes: the conflict between disconnection and digital wellbeing, and the distinction between considering digital wellbeing as a sociocultural construct and a psychological state. They make the need for a more comprehensive research agenda that takes into account both personal experiences and cultural influences, emphasising that future studies need to take into account how quickly mobile connectivity is changing and how this may affect users' mental and social well-being.

Research Gap:

Although the topic is becoming more and more popular, there aren't many systematic assessments that concentrate on university students in particular, who are tech-savvy and exposed to certain social and academic demands. Current research frequently focusses on certain facets of wellbeing (such as academic stress or emotional control), but it falls short of providing a comprehensive picture of how different dimensions interact. Furthermore, the area mainly uses self-reported data, and there are discrepancies in the definition and assessment of digital wellness. These methodological problems impede the development of successful interventions and the production of findings that can be applied broadly.

Analysis and Discussion:

The findings from this systematic review reveal that problematic smartphone usage (PSU) is a pervasive and multidimensional issue, significantly influencing various aspects of university students' digital wellbeing. Academic achievement, social relationships, physical health, and psychological and emotional well-being are the area's most severely impacted. Furthermore, factors such as usage motivation, app type, cultural context, and methodological limitations play crucial roles in shaping how these impacts manifest.

1. Psychological and Emotional Wellbeing:

Among the numerous domains, psychological wellbeing emerges as the most consistently and severely impacted by PSU. Several studies have demonstrated strong associations between excessive smartphone

use and increased levels of stress, anxiety, and depression among university students (Elhai et al., 2017; Rozgonjuk et al., 2018). Constant exposure to notifications, social comparisons, and digital overload are some of the factors that lead to these results; these factors combined cause emotional dysregulation and cognitive exhaustion. This effect limits users' capacity to relax and disengage by imposing a constant psychological demand on them, which is frequently exacerbated by "fear of missing out" (FOMO).

Furthermore, this problem is made worse by PSU, which seems to intensify pre-existing emotional vulnerabilities including attention-related issues and alexithymia (difficulty recognising and expressing feelings), resulting in a vicious cycle of distress. Although students may use smartphones as a coping strategy for stress or loneliness at first, this activity frequently turns into a maladaptive one with time, increasing their emotional distress and encouraging compulsive use. This observation is consistent with Davazdahemami et al. (2016), who highlight the moderating function of self-regulation and point out that students who possess greater self-control are less inclined to develop smartphone addiction habits. Therefore, improving impulse control and emotional resilience may be important safeguards against the decline in mental health associated with PSU.

2. Academic Performance and Cognitive Function

PSU's academic consequences are similarly significant. Smartphones are unquestionably useful tools for communication, learning, and productivity, but when used improperly for academic purposes, they seriously impair students' focus and performance. Ahmed et al. (2023) and according to Samaha & Hawi (2016) using a smartphone for non-academic purposes, especially during study sessions or lectures, is linked to worse academic performance and decreased memory recall. Interrupting attention cycles with notifications and message alerts leads to multitasking tendencies that lower learning effectiveness.

Furthermore, the type of smartphone use has a significant influence on how it affects academic performance. While social networking or gaming applications are frequently diversions, note-taking, reading, and task-organizing apps, for instance, may increase productivity and focus. Studies like those conducted by Ahmed et al. (2023), which discovered that, depending on how the technology is incorporated into study habits, productive smartphone use can positively correlate with academic achievement, support this distinction.

Niu et al. (2022) investigated the hypothesis that cognitive performance on complicated tasks can be hampered by the sheer presence of a smartphone, even if it is not being used. However, Koessmeier and Buttner (2022) contest this, arguing that human characteristics (such as self-discipline and digital habits) and task difficulty reduce this effect. In order to comprehend the causal pathways by which smartphone usage disrupts academic focus, more study is necessary, especially experimental and longitudinal investigations.

3. Social Wellbeing and Interpersonal Relationships

PSU has complex and occasionally conflicting implications on social wellbeing. Smartphones, on the one hand, can help people connect and communicate, particularly when it comes to sustaining long-distance relationships and creating online communities. However, excessive use, particularly of messaging apps and social media, has been linked to decreased empathy, social isolation, and feelings of loneliness (Hamida et al., 2021; Diao et al., 2023).

The use of digital communication in place of in-person interactions is one important problem. In real-life contacts, students who predominantly rely on online socialisation frequently report feeling less supported by their peers. This implies that relationships formed online could not have the same emotional depth and immediateness as those formed in person. But here, individual variances are really important. For example,

Lin and Chiang (2017) failed to find a significant correlation between PSU and sociability in certain student groups, suggesting that communication preferences, cultural norms, and personality qualities all affect results. Because of this complexity, social welfare should be seen as a variable that is influenced by environment, intention, and user attributes rather than as a binary result of smartphone use.

4. Physical Wellbeing and Lifestyle Behaviours

The effect of PSU on physical health is becoming a significant problem, albeit being less researched than in the academic or psychological areas. The most often reported physical complaint is sleep disturbance, and using a smartphone late at night causes shorter sleep length, worse quality, and delayed sleep beginning (Wang et al., 2023; Vedova et al., 2022). These disturbances have an indirect effect on students' mental and academic functioning since they not only hinder physical recovery but also degrade mood and cognitive function.

Furthermore, PSU is associated with unhealthy eating habits and sedentary behaviour, especially when students use their phones during mealtimes or breaks meant for exercise (Kononova et al., 2018). This leads to a lifestyle devoid of routine and movement, which raises the risk of tiredness, weight gain, and metabolic health problems. Even while psychological effects frequently overwhelm these results, they have important implications for the future which necessitate a more comprehensive approach to digital wellbeing.

5. Functionality and Motivation of Use

The goal and substance of smartphone use is a crucial subject that cuts across all aspects of wellbeing. Screen time by itself is not a good predictor of danger, as the data repeatedly demonstrates. Rather, results are strongly influenced by the usefulness and motivation of use. While students who use their phones for entertainment, avoidance, or emotional regulation typically report higher levels of PSU and distress, those who use them for academic or organisational purposes, for instance, may perform better and feel less stressed (Ahmed et al., 2023; Panova, 2019).

This result emphasises the significance of intentionality. When students use smart phones as a coping strategy for loneliness, boredom, or anxiety, they frequently perpetuate a maladaptive behavioural cycle that furthers their emotional detachment and dependence. On the other hand, using smartphones in an organised and purposeful manner can help with task completion and self-efficacy. This contrast emphasises the necessity of programs that encourage healthier, more purpose-driven digital habits in addition to reducing screen time.

6. Methodological Gaps and Conceptual Limitations

There are significant methodological and conceptual barriers in the discipline, despite the expanding body of study. Most research uses self-report surveys, which are prone to social desirability bias, recollection bias, and false screen time reporting. Furthermore, it is difficult to determine causal linkages or monitor changes in digital wellbeing over time due to the dearth of experimental and longitudinal research methodologies.

In addition, there is no common definition of digital wellbeing, which is another significant problem. There are scholars that prioritise psychological well-being and emotional equilibrium (e.g., Abeele, 2021), while others concentrate on social interaction, focus, or even efficiency. The creation of cohesive assessment instruments or interventions as well as cross-study comparisons are hampered by this conceptual fragmentation. According to Abeele and Nguyen (2021), digital wellbeing is a psychological condition and a sociocultural construct that encompasses both individual behaviour and larger digital ecosystems.

Implications of the Study

There are theoretical and practical implications to this review. The results point to the necessity for educational institutions to create lesson plans that reduce smartphone distractions and encourage digital literacy. These insights can be used by counsellors and health professionals to develop support programs that target the behavioural and emotional symptoms of PSU. This synthesis can help policymakers create focused initiatives that encourage healthy digital habits. Finally, this study lays the groundwork for future studies to use more exacting approaches and thoroughly examine under-represented aspects like physical and social welfare.

Conclusion

A wide range of studies examining the impact of smartphone use on university students' digital wellness are summarised in this systematic review. Academic performance, psychological health, and, to a lesser extent, physical and social wellness are all negatively impacted by problematic smartphone use, according to the research. While the consequences on the social and academic spheres are more unpredictable and context-dependent, emotional problems like stress and anxiety are the ones that are most frequently mentioned. The analysis also identifies serious methodological flaws in previous research, emphasising the need for more objective metrics and better definitions of digital wellness. Through the identification of these gaps, this article advances the field and informs successful treatments. To promote a healthier, more balanced digital lifestyle, university students must be encouraged to use smartphones responsibly.

References:

1. Burr, C., Taddeo, M., & Floridi, L. (2020). The ethics of digital wellbeing: A thematic review. *Science and Engineering Ethics*, *26*(4), 2313–2343.
2. https://doi.org/10.1007/s11948-020-00175-8
3. Gui, M., Fasoli, M., & Carradore, R. (2017). "Digital well-being". Developing a new theoretical tool for media literacy research. *Italian Journal of Sociology of Education*, *9*(1), 155–173.
4. https://doi.org/10.14658/pupj-ijse-2017-1-8
5. Widdicks, K., Bates, O., Hazas, M., & Friday, A. (2017). *Designing for digital wellbeing and its challenges in everyday life* [Paper presentation]. Proceedings of ACM Conference (Conference'17) (Vol. 4). ACM.
6. Vanden Abeele, M. M. P. (2021). Digital wellbeing as a dynamic construct. *Communication Theory*, *31*(4), 932–955.
7. https://doi.org/10. 1093/ct/qtaa024
8. Vanden Abeele, M. M. P., Vandebosch, H., Koster, E. H. W., De Leyn, T., Van Gaeveren, K., de Segovia Vicente, D., Van Bruyssel, S., van Timmeren, T., De Marez, L., Poels, K., DeSmet, A., De Wever, B., Verbruggen, M., & Baillien, E. (2024). Why, how, when, and for whom does digital disconnection work? A process-based framework of digital disconnection. *Communication Theory*, *34*(1), 3–17.
9. https://doi.org/10.1093/ct/qtad016
10. Goofgle. (n.d). *Digital wellbeing*. https://wellbeing.google/for-developers/
11. Busch, P. A., & McCarthy, S. (2021). Antecedents and consequences of problematic smartphone use: A systematic literature review of an emerging research area. *Computers in Human Behavior*, *114*(2021), 106414.
12. https://doi.org/10.1016/j.chb.2020.106414

13. Elhai, J. D., Dvorak, R. D., Levine, J. C., & Hall, B. J. (2017). Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. *Journal of Affective Disorders*, *207*, 251–259.

14. https://doi.org/10.1016/j.jad.2016.08.030

15. Davazdahemami, B., Hammer, B., & Soror, A. (2016). *Addiction to mobile phone or addiction through mobile phone?* [Paper presentation]. 2016 49th Hawaii International Conference on System Sciences (HICSS) (pp. 1467–1476). IEEE.

16. Urmanov, B., & Hoyoung, S. (2021). *An empirical investigation on the factors affecting smartphone addiction in digital era: Effect of social networking services and instant messaging applications usage* [Paper presentation]. The 5th International Conference on Future Networks & Distributed Systems (pp. 473–484)

17. Lin, T. T. C., & Chiang, Y.-H. (2017). Investigating predictors of smartphone dependency symptoms and effects on academic performance, improper phone use and perceived sociability. *International Journal of Mobile Communications*, *15*(6), 655–676.

18. https://doi.org/10.1504/IJMC.2017.086881

19. Hao, Z., Jin, L., Li, Y., Akram, H. R., Saeed, M. F., Ma, J., Ma, H., & Huang, J. (2019). Alexithymia and mobile phone addiction in Chinese undergraduate students: The roles of mobile phone use patterns. *Computers in Human Behavior*, *97*, 51–59.

20. https://doi.org/10.1016/j.chb.2019.03.001

21. Ahmed, M. S., Jahangir, R., Mohammad, R., Hadi, A., Hossain, E., & Ahmed, N. (2023). A minimalistic approach to predict and understand the relation of app usage with students' academic performance. *Proceedings of the ACM on Human-Computer Interaction*, 7 (MHCI), 1–28.

22. Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in Human Behavior*, *57*, 321–325. https://doi.org/10.1016/j.chb.2015.12.045

23. Rozgonjuk, D., Kattago, M., & T€aht, K. (2018). Social media use in lectures mediates the relationship between procrastination and problematic smartphone use. *Computers in Human Behavior*, *89*, 191–198.

24. https://doi.org/10.1016/j.chb.2018.08.003

25. Rozgonjuk, D., Levine, J. C., Hall, B. J., & Elhai, J. D. (2018). The association between problematic smartphone use, depression and anxiety symptom severity, and objectively measured smartphone use over one week. *Computers in Human Behavior*, *87*, 10–17. https://doi.org/10.1016/j.chb.2018.05.019

26. Rozgonjuk, D., Rosenvald, V., Janno, S., & T€aht, K. (2016). Developing a shorter version of the Estonian smartphone addiction proneness scale (E-SAPS18). *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *10*(4), 99–116.

27. https://doi.org/10.5817/CP2016-4-4

28. Zhao, L., & Hounnaklang, N. (2021). *Association between smartphone addiction and mental health during the COVID-19 pandemic 2021 among inner Mongolia Medical University students, China* [Paper presentation]. Proceedings of the 2021 International Conference on Intelligent Medicine and Health (pp. 115–124).

29. Kushlev, K., Proulx, J., & Dunn, E. W. (2016). *"Silence your phones" Smartphone notifications increase inattention and hyperactivity symptoms* [Paper presentation]. Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (pp. 1011–1020).

30. Funk, J. M., Lakier, M., O'Gorman, M., & Vogel, D. (2021). *Exploring smartphone relationships through Roland Barthes using an instrumented pillow technology probe* [Paper presentation]. Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1–13).

31. Subramaniam, S., Singh Dhillon, J., Cheah Kah Hoe, A., Shanmugam, M., & Shamini Gunasekaran, S. (2020). *Evaluating smartphone addiction disorder among university students* [Paper presentation] 2020 8th International Conference on Information Technology and Multimedia (ICIMU) (pp. 348–353). IEEE.

32. Ding, Z.-C., Yan, J., & Fu, J. (2021). Internet and mobile phone addiction self-control mediate physical exercise and subjective well-being in young adults using IoT. *Mobile Information Systems*, *2021*, 1–6. https://doi.org/10.1155/2021/9923833

33. Kononova, A., McAlister, A., & Oh, H. J. (2018). Screen overload: Pleasant multitasking with screen devices leads to the choice of healthful over less healthful snacks when compared with unpleasant multitasking. *Computers in Human Behavior*, *80*, 1–11.

34. https://doi.org/10.1016/j.chb.2017.10.042

35. Hamida, A., Fuad Nashori, H., & Syamila, M. R. (2021). *Smartphone addiction as mediator effect loneliness to empathy among Generation Z* [Paper presentation]. 2021 9th International Conference on Cyber and IT Service Management (CITSM) (pp. 1–6). IEEE.

36. Almourad, M. B., Alrobai, A., Skinner, T., Hussain, M., & Ali, R. (2021). Digital wellbeing tools through users lens. *Technology in Society*, *67*, 101778.

37. https://doi.org/10.1016/j.techsoc.2021.101778

38. Panova, T., & Lleras, A. (2016). Avoidance or boredom: Negative mental health outcomes associated with use of Information and Communication Technologies depend on users' motivations. *Computers in Human Behavior*, *58*, 249–258.

39. https://doi.org/10.1016/j.chb.2015.12.062