

Effect of Digital Behaviors on Mental Well-Being, Burnout, and Sleep Quality among Students

Sana^{*1}, Sadia Shaukat^{*2}, Ammara Waheed^{*3} Marina Anwar^{*4}

^{*1}*MSCP, Riphah International University, Islamabad, Pakistan*

^{*2}*Chairperson Zeal and Zest Learning Foundation, Islamabad, Pakistan*

^{*3}*MSCP, Riphah International University, Islamabad, Pakistan*

^{*4}*MS in psychology (Scholar) Foundation University Islamabad, Pakistan*

Abstract- Digital technologies dominate students' academic, social, and leisure activities, although excessive use of digital media can harm psychological well-being. In this cross-sectional study, we examined the predictive role of digital engagement patterns on well-being, burnout, and sleep quality among university students. A sample of 120 students (60 males and 60 females) from Islamabad/Rawalpindi completed the (WEMWBS), (DBOS), and (PSQI). Correlation analyses showed that increased digital engagement was linked to higher burnout, lower mental well-being, and poorer sleep quality. Emotional exhaustion emerged as the most significant predictor of decreased well-being and disrupted sleep. These findings highlight the mental health risks of heavy online use and underscore the need for interventions promoting healthy technology habits and sleep maintenance. The study enhances understanding of how digital behaviors influence students' emotional, cognitive, and physical performance.

Keywords: digital behaviors, mental well-being, burnout, sleep-quality, students.

I. INTRODUCTION

Digital technology has already taken its place in the everyday life of university students, as it influences the process of studying, communication habits, and leisure (Lenhart et al., 2015). Smartphones, laptops, and tablets enable uninterrupted access to study materials and an immediate social connection. This digital integration can increase efficiency and convenience, but it also brings some challenges that can impair emotional stability, mental resilience, and normal operation (Umasankar et al., 2022).

Digital behaviors refer to the intensity, length, and intent of engagement with digital devices. The university students have high digital access owing to the academic requirements, online communication, and a variety of entertainment systems. The unregulated and excessive use of digital devices has been associated with stress, emotional exhaustion, and negative social comparison, which can negatively affect mental health (Elhai et al., 2020; Fardouly and Vartanian, 2016).

Mental well-being, which is a combination of our emotions, thoughts, and relations, is the foundation of how students learn, relate with others, and enjoy life (Ryff, 1989; Diener et al., 2009). However, the current usage of technology may undermine that base without commotion. We overload our brains when we are compulsively glancing at our devices, move between multiple screens at once, or go online scrolling into the night. It is a mental burden, emotional exhaustion, and division of attention that destroys our emotions of relaxation and concentration (Orben and Przybylski, 2019).

Burnout is the breaking point of many students, a condition of constant emotional and physical fatigue. With the growing digital demands on students who already have big academic demands, students are left with hardly anything to give. The use of constant notifications and the need to always be available online causes a reduction in recovery time. In the meantime, the constant flow of comparisons over the internet makes them feel inferior, which drives another loop of fatigue even more (Maslach et al., 2001; Tuncer et al., 2021).

One of the main pointers of the influence of digital habits on our well-being is sleep quality. Whenever we are glued to screens, particularly in the evening hours, the blue light that is produced by phones, tablets, and laptops, similar to an invisible alarm clock, shifts our circadian clock. Combined with that nightly scrolling, chatting, or binge-watching, this pre-sleep behavior causes a disruption of the time of sleep onset, reduces our total rest, and leaves us with less productive sleep (Cajochen et al., 2011; Hale

& Guan, 2015). The ensuing consequences are extensive: the sleepiness of the mood, the blurry cognition, and the high risk of burnout become a regular symptom of people who regularly open the screen light at night (Exelmans and Van den Bulck, 2016).

Most of the studies have focused on the effects of individual digital habits on either well-being or burnout or sleep; few have made a holistic analysis of the three outcomes among a study population of students. By mapping the interventions of the variables screen use, mental health, fatigue, and rest, we will be able to develop an evidence-based solution, such as think digital breaks, mindfulness exercises, and scheduled screen-use plans that could aid students in becoming healthier and achieving higher academic performance. The current research paper seals that gap by examining the predictive capacity of various digital behaviors on well-being, burnout, and sleep quality among university students and providing tangible results regarding how interventions may be tailored to achieve positive outcomes in terms of both student well-being and student learning.

Literature Review

Digital Behaviors and University Students

Digital behaviors, which are the daily habits of how students engage with technologies, be it scrolling feeds or multitasking between school and leisure, have been a hallmark of the new world of university life. According to recent surveys, students dedicate approximately 34 hours a day to social media, which is sufficient to compete or even overcome focused studying time (Smith and Brown, 2021; Lenhart et al.,

2015; Umasankar et al., 2022). Although it is hard to deny that these tools enhance learning and social connectivity, the reverse side is becoming more apparent. This leads to cognitive overload (Eppler and Mengis, 2004), emotional exhaustion and divided attention (Rosen et al., 2013). Social comparison processes and the endless flow of negative or misleading information (Fardouly and Vartanian, 2016; Kross et al., 2013) complicate the situation and may destroy self-esteem and well-being.

Digital Behaviors and Mental Well-Being

The relationship with digital technology is becoming more and more contributing to mental well-being: emotional stability, resilience, and successful social functioning (Diener et al., 2009). Studies show that when used in excess or compulsively, digital use may damage well-being by increasing stress and contributing to unhealthy social comparison and limiting the recovery of offline social life (Orben and Przybylski, 2019). Conversely, strategic digital pauses and conscious device utilization are associated with improved emotional control and elevated life happiness (Garcia and Patel, 2022).

Digital Behaviors and Burnout

Digital engagement is also associated with high levels of burnout, defined as emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach and Jackson, 1981). Recurrent screen time exerts constant cognitive effects and restricts the possibility of psychological rest (Brinkman and Kirschner, 2019). There is also a growing amount of information that indicates that organized digital breaks and conscious technology

usage may mitigate the symptomatic effects of burnout (Smith and Jones, 2023).

Digital Behaviors and Sleep Quality

The quality of sleep, including the duration of our sleep, the continuity of our sleep, and the feeling of restfulness, relies on our nighttime use of digital technology (Nelson and Davis, 2021). It has been demonstrated in various works that screen time before sleep postpones the onset of sleep, reduces the quality of sleep overall, and reduces the total duration of sleep (Hale & Guan, 2015;

Exelmans & Van den Bulck, 2016). Two primary offenders come into the limelight, and they include the blue light of electronic gadgets, which alters our circadian patterns, and the stimulatory content that makes our brains work (Cajochen et al., 2011). Evening screen time reduction has always been associated with sleep and an increase in general well-being (Roberts & Kew, 2020).

Gaps in Current Research

Although the research on digital habits of students continues to rise steadily, very few studies have concurrently related digital habits with mental well-being, burnout, and sleep quality, and none of them has measured all four constructs using the same correlational framework. This research design weakness restricts us to charting the multifaceted, two-way interactions that online interaction can produce on the psychological well-being of university students. By filling this gap, the current study will offer insights into the interaction between patterns of online behavior with stress, exhaustion, and rest to provide a more sophisticated evidence base for

developing specific, data-driven interventions to protect the well-being of students.

Methodology

Objectives

1. To investigate the relationship between digital behaviors and mental well-being among university students.
2. To address the association between digital behaviors and sleep quality.
3. To investigate the interplay between digital burnout, mental condition, and quality of sleep.

Research Design

This study employed the cross-sectional correlational design to examine the relationship between the patterns of digital engagement of students and three main psychosocial outcomes, including mental well-being, burnout, and quality of sleep.

Sample

There were 120 university students who participated in the research, with an equal distribution of male and female respondents. They were selected from institutions in Islamabad and Rawalpindi, and all were full-time students who were regular users of digital devices, smartphones, laptops, and tablets. In order to make sure that every participant fulfilled the inclusion criteria of the study and that the sample represented the target population, we used a criterion-based purposive sampling system. This method assisted us

in coming up with a representative and a very relevant cohort to our research questions.

Instruments

Mental Well-Being, a reliable measure of the overall psychological health of the participants, a general measure of mental well-being, using the Warwick Edinburgh Mental Well-Being Scale (Tennant et al., 2007). The Digital Burnout Scale (Erten & Ozdemir, 2020) was a measure of exhaustion and disengagement directly related to using technology. The Sleep Quality was assessed with the help of the Pittsburgh Sleep Quality Index (Buysse et al., 1989), which assessed the perceived disturbances in sleep, the length of sleep, and restorative sleep.

Procedure

A purposive, criterion-based sampling of students in the universities of Rawalpindi and Islamabad was used to recruit the students. The data collection has occurred in a physical form: subjects were asked to fill out an array of questionnaires that included some standardized questions, which measured their online behavior, psychological well-being, burnout, and the quality of their sleep. The participants were required to give their report on how they normally interacted and spent time with digital devices in their daily lives. The research design adopted a correlational, cross-sectional method to enable researchers to test how digital behaviors relate to psychological outcomes by not modifying the natural habits of the research subjects. In the process, confidentiality was ensured, it was voluntary, and informed consent was taken.

Results

The study explored the relationships among digital behaviors, mental well-being, burnout, and sleep quality in university students. Descriptive statistics and Pearson correlation analyses were conducted on data collected from 120 participants (60 males, 60 females).

Table 01

Psychometric Properties of the study Constructs (N=120)

Constructs	k	α	M	SD	Range		Skewness	Kurtosis
					Potential	Actual		
MWBS	14	.79	45.5	7.36	14-70	9-64	-.18	.11
DBOS	24	.87	72.7	14.5	24-120	24-110	-.28	.05
DA	12	.81	36.5	7.94	12-60	12-59	-.05	.21
DD	06	.79	18.8	5.41	6-30	6-30	-.13	-.38
EE	06	.70	17.2	4.51	6-30	6-27	-.07	-.31
PSQI	19	.71	5.37	2.81	0-21	0-14	.40	.15

** $p < 0.01$, * $p < 0.05$ Note: k= No. of items, M= Mean, SD= Standard Deviation, α = Cronbach Alpha; MWBS = Mental Well-being Scale; DBOS=Digital Burnout Scale; DA =Digital Aging; DD = Digital Deprivation; EE = Emotional Exhaustion; PSQI= Pittsburgh Sleep Quality Index.

Table 01 summarizes the psychometric properties of the instruments used in the research. Both the Mental Well-Being Scale (MWBS) and the Digital Burnout Scale (DBOS) have good internal consistency ($\alpha=.79$) and ($\alpha=0.87$), respectively. The index of Pittsburgh Sleep Quality (PSQI) achieved sufficient reliability ($\alpha=.71$). In the DBOS, the three subscales, including Digital Aging (DA), Digital Deprivation (DD), and Emotional Exhaustion (EE), had acceptable reliabilities with a range of between 70 and 81. In general, the skewness and kurtosis values were positive, indicating that the data were good and normally distributed.

Table 02

Constructs	1	2	3	4	5	6
1. MWBS	-	-.16*	-.16*	-.20	-.28*	.22*
2. DBOS		-	.87**	.68*	.77**	-.28*
3. DA			-	.31*	.65**	-.11
4. DD				-	.28*	-.23*
5. EE					-	-.06*
6. PSQI						-

Correlation between study constructs (N=120)

** $p < 0.01$, * $p < 0.05$; Note: MWBS = Mental Well-being Scale; DBOS=Digital Burnout Scale; DA =Digital Aging; DD = Digital Deprivation; EE = Emotional Exhaustion; PSQI= Pittsburgh Sleep Quality Index.

According to Table 02, mental well-being (MWBS) was found to be negatively correlated with digital burnout (DBOS; $r = -.16$, $p = .05$) and its subscales digital aging (DA; $r = -.16$, $p = .05$), digital deprivation (DD; $r = -.20$, $p = .05$), and emotional exhaustion (EE; $r = -.28$, $p = .01$), which shows modest negative correlations. MWBS was positively linked to sleep quality (PSQI; $r = .22$, $p < .05$). Digital burnout (DBOS) demonstrated a strong positive correlation with its subscales (DA: $r = .87$, DD: $r = .68$, EE: $r = .77$) which confirms the validity of the scale, as well as negative correlation with sleep quality ($r = -.28$, $p = .05$). In general, increased levels of digital burnout and its subscale were slightly associated with reduced mental health and marginally worse sleep with emotional exhaustion demonstrating the most significant negative correlation.

Summary of Key Findings

Overall, these results show that the increased levels of digital burnout and its subscales are moderately related to reduced mental health and partially reduced

sleep quality in university students. Emotional exhaustion had the highest negative relationship with well-being, although the relationships are not very strong, which indicates that more factors might affect the psychological health and sleep performance of students.

Discussion

This research paper provides a new dimension to the research on the impact of daily digital interactions on the emotional and physical health of students beyond the spectrum of their addiction or problem use. The study indicates an insignificant but significant correlation between the quality of sleep and mental health: students with higher self-reported sleep quality were also more likely to report greater levels of psychological well-being. The findings are similar to the earlier research (Alvaro et al., 2013; Hamilton et al., 2021) that indicates sleep as the foundation of emotional stability, clarity of thought, and strength. With a hectic life filled with university classes, late-night cramming, scrolling social-media feeds, and incessant reminders, it can be difficult to prioritize sleep habits as a vital protective measure against burnout and stress, and thus, making this a habit is essential to avoid fatigue and stress. To put it simply, the study serves as a reminder that our current digital and sleeping patterns can be modified in a small way to extend their benefits in the overall state of our mental health

Digital burnout was minimally correlated with the mental health of students. The reporters who reported experiencing greater emotional exhaustion, being

overloaded with digital information, and being unable to disengage with technology also reported worse overall well-being, although emotional exhaustion was the most significant predictor. The results are reminiscent of the previous studies that have continued to support that digital engagement also increases stress levels, mental exhaustion, and reduces life satisfaction (Thomée et al., 2011; Salmela-Aro et al., 2017).

The patterns of burnout were linked to worse sleep quality. Specifically, disrupted sleep was associated with increased digital fatigue (particularly, emotional exhaustion and cognitive overload). This is consistent with the evidence that the use of the screen in the late hours and constant connectivity disrupts circadian rhythms and inhibits nighttime rest (Chang et al., 2015; Exelmans and Van den Bulck, 2016). Therefore, online strain has an impact on daytime performance and sleep, which may lead to a vicious cycle of exhaustion and poor health.

These findings help to highlight the significance of tracking online behaviors and implementing organized countermeasures against them, including taking regular device breaks, digital curfews, and purposeful offline time. Attentive, moderate use of technology is one of the ways to prevent burnout, enhance mental health, and increase the quality of sleep in university students.

Limitations and Implications for Future Research

1. The participants of the study were restricted to the students of Islamabad and Rawalpindi Universities, which limits the application of the research. Increasing the sample to include students in different regions, disciplines, and cultures will strengthen external validity and allow us to learn the ways digital habits are practiced in different educational environments.
2. Although self-report questionnaires are easy, they are prone to social desirability and biases towards recall. Adding objective data, i.e., passive screen-time data and wearable sleep data or application analytics, can give a better image of real-digital activity and sleep patterns.
3. No academic pressure, extracurricular activities, or lifestyle factors (e.g., caffeine usage, exercise) were considered, which obscured the causal relationship between use of digital media and such outcomes as burnout or sleep quality. Future researches need to take up longitudinal or experimental designs, and covariates to reflect these contextual factors.
4. The present discussion considers the whole digital use as a block without considering the differences between academic, social, and recreational screen time. Breaking these categories down will shed light on whether social media scrolling or scholarly research on the internet has a dissimilar effect on mental health and sleep habits.
5. There were no variables that included coping strategies and mindfulness, personality traits, or perceived social support. These factors may be researched to find out whether some students may be more resistant to digital overload, and inform the specific intervention or policy recommendations.

Conclusions

It has been found that the usage of digital devices by students is closely associated with mental health. Emotional exhaustion and digital fatigue were the largest contributors to poor well-being and sleep. Students who recorded high rates of those symptoms were less psychologically well and experienced poorer sleep quality. Conversely, even more so, the people who had slept better reported more overall well-being, and this is the protective aspect of sleep. These findings indicate that digital technology is not just a luxury; it has the potential to be cumulative in negative implications on emotional, cognitive, and physical health when consumed in excess. They should integrate digital-wellness programs into university campuses, i.e., structured screen-time constraints, mindfulness and sleep-hygiene training, digital-detox workshops, and stress-management sessions. Institutions can support students to mitigate burnout and enhance resilience and long-term mental and physical well-being by promoting purposeful, balanced tech use and frequent offline practices.

REFERENCES

- [1] Ahola, K., & Hakanen, J. (2007). Job strain, burnout, and depressive symptoms: A prospective study among dentists. *Journal of Affective Disorders, 104*, 103–110. <https://doi.org/10.1016/j.jad.2007.03.004>
- [2] Alvaro, P. K., Roberts, R. M., & Harris, J. K. (2013). A systematic review assessing bidirectionality between sleep disturbances, anxiety, and depression. *Sleep, 36*(7), 1059–1068. <https://doi.org/10.5665/sleep.2810>
- [3] Cajochen, C., Frey, S., Anders, D., Späti, J., Bues, M., Pross, A., ... & Stefani, O. (2011). Evening exposure to a light-emitting diode (LED)-backlit computer screen affects circadian physiology and cognitive performance. *Journal of Applied Physiology, 110*(5), 1432–1438. <https://doi.org/10.1152/jappphysiol.00944.2010>
- [4] Chang, A.-M., Aeschbach, D., Duffy, J. F., & Czeisler, C. A. (2015). Evening use of light-emitting eReaders negatively affects sleep, circadian timing, and next-morning alertness. *Proceedings of the National Academy of Sciences, 112*(4), 1232–1237. <https://doi.org/10.1073/pnas.1418490112>
- [5] Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (2009). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*(2), 276–302. <https://doi.org/10.1037/a001691>
- [6] Elhai, J. D., Yang, H., McKay, D., & Asmundson, G. J. G. (2020). COVID-19 anxiety and Problematic smartphone use: Testing the mediational role of anxiety sensitivity. *Psychiatry Research, 289*, 113073. <https://doi.org/10.1016/j.psychres.2020.113073>
- [7] Erten, S., & Özdemir, A. (2020). Development and validation of the Digital Burnout Scale (DBOS). *Computers in Human Behavior, 112*, 106466. <https://doi.org/10.1016/j.chb.2020.106466>
- [8] Exelmans, L., & Van den Bulck, J. (2016). Bedtime mobile phone use and sleep in adults. *Social Science & Medicine, 148*, 93–101. <https://doi.org/10.1016/j.socscimed.2015.11.037>
- [9] Fardouly, J., & Vartanian, L. R. (2016). Social media and body image concerns: Current research and future directions. *Current Opinion in Psychology, 9*, 1–5. <https://doi.org/10.1016/j.copsyc.2015.09.005>
- [10] Garcia, R., & Patel, S. (2022). Digital detox and mental well-being in university students: A review. *Journal of Educational Psychology, 114*(6), 1200–1215. <https://doi.org/10.1037/edu0000721>
- [11] Hale, L., & Guan, S. (2015). Screen time and sleep among school-aged children and adolescents: A systematic literature review. *Sleep Medicine Reviews, 21*, 50–58. <https://doi.org/10.1016/j.smrv.2014.07.007>
- [12] Hamilton, N. A., Knight, K. L., & Ries, A. J. (2021). Sleep and psychological well-being. In *Mental Health and Sleep*.
- [13] Lenhart, A., Smith, A., Anderson, M., Duggan, M., & Perrin, A. (2015). Teens, technology and friendships. Pew Research Center.
- [14] Maslach, C., Jackson, S. E., & Leiter, M. P. (2001). *Maslach burnout inventory manual* (3rd ed.). Consulting Psychologists Press.
- [15] Orben, A., & Przybylski, A. K. (2019). The association between adolescent well-being and digital technology use. *Nature Human Behaviour, 3*(2), 173–182. <https://doi.org/10.1038/s41562-018-0506-1>
- [16] Roberts, L., & Kew, R. (2020). Evening screen time reduction and sleep quality in college students. *Behavioral Sleep Medicine, 18*(4), 405–419. <https://doi.org/10.1080/15402002.2019.1640729>
- [17] Salmela-Aro, K., Mutanen, P., Vuori, J., & Kinnunen, U. (2017). Physical education burnout and health among adolescents. *Journal of Adolescence, 62*, 104–113. <https://doi.org/10.1016/j.adolescence.2017.10.005>
- [18] Smith, A., & Brown, J. (2021). Digital engagement and mental health among university students. *Computers in Human Behavior, 120*, 106747. <https://doi.org/10.1016/j.chb.2021.106747>
- [19] Smith, P., & Jones, K. (2023). Mindful digital behavior and burnout in academic populations. *Journal of American College Health, 71*(3), 789–798. <https://doi.org/10.1080/07448481.2021.1874971>
- [20] Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., ... & Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS): Development and UK validation. *Health and Quality of Life Outcomes, 5*, 63. <https://doi.org/10.1186/1477-7525-5-63>
- [21] Thomée, S., Härenstam, A., & Hagberg, M. (2011). Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults: A prospective cohort study. *BMC Public Health, 11*, 66. <https://doi.org/10.1186/1471-2458-11-66>
- [22] Tuncer, D., Öztürk, Ç., & Yıldırım, K. (2021). Digital burnout among university students: The impact of screen time and social media usage. *Journal of Educational Technology & Society, 24*(2), 210–225.
- [23] Umasankar, S., Mehta, R., & Singh, P. (2022). Digital media consumption patterns among university students: Implications for mental health. *Journal of College Student Development, 63*(5), 601–617.
- [24] Xie, Y., Dong, Y., & Wang, S. (2018). Digital burnout and sleep quality: Examining mediating effects of stress. *Computers in Human Behavior, 88*, 132–138. <https://doi.org/10.1016/j.chb.2018.06.004>

AUTHORS

First Author (Corresponding Author)*– Sana: MSCP, Riphah International University, Islamabad, Pakistan
Second Author – Sadia Shaukat: Chairperson Zeal and Zest Learning Foundation, Islamabad, Pakistan
Third Author – Ammara Waheed: MSCP, Riphah International University, Islamabad, Pakistan
Fourth Author – Marina Anwar: MS in psychology (Scholar), Foundation University Islamabad, Pakistan