

# The Digital Diet: A Quantitative Analysis of Screen Time, Social Media Usage, and Mental Health Indicators among Contemporary Digital Users

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**Abstract:** This study investigates the multifaceted relationship between digital technology consumption and psychological well-being through a quantitative analysis of 2,000 unique individuals. As digital integration becomes ubiquitous, understanding the specific behavioural patterns that lead to psychological distress versus resilience is critical. By analysing variables including daily screen time, social media usage, sleep quality, mindfulness minutes, and mental health scores (measured on a 20–80 scale), the research aims to identify key risk factors and protective behaviours in modern digital diets.

Findings reveal a complex, non-linear relationship between screen time and mental health. The average participant engages in 6.02 hours of daily screen time, with a mean mental health score of 49.65 and a stress level of 5.54 on a 1–10 scale. Moderate users (4–8 hours) represent the largest cohort and maintain relatively stable mental health, while high users (8–12 hours) do not consistently demonstrate higher anxiety levels. This suggests that the qualitative nature of digital engagement may outweigh quantitative exposure.

The study identifies sleep quality and duration as primary buffering variables against psychological stress. Additionally, mindfulness practices and physical activity significantly enhance mental health outcomes, even among high-frequency users. The findings suggest that digital hygiene and behavioural balance are more effective predictors of well-being than strict screen-time limitations. These insights provide a foundation for designing holistic digital wellness interventions.

**Keywords:** Digital Technologies, Social Media, Mental Health, Screen Time, Digital Wellbeing, Anxiety, Depression, Cognitive Fatigue.

## 1. INTRODUCTION

The proliferation of digital technologies has fundamentally transformed modern human life, reshaping communication, work, education, and leisure activities. Digital devices such as smartphones, laptops, and tablets have become indispensable, enabling continuous

connectivity and access to information. In this context, individuals are increasingly immersed in digital environments, often spending significant portions of their daily lives interacting with screens. The dataset analysed in this study reflects this reality, with users spending an average of 6.02 hours per day engaged in screen-based activities.

While digital technologies offer numerous advantages, including improved productivity and social connectivity, concerns regarding their impact on mental health have intensified. Several studies have linked excessive screen exposure to increased levels of stress, anxiety, depression, and cognitive fatigue. In the present study, participants reported a mean stress level of 5.54 on a 10-point scale, indicating a moderate yet noteworthy psychological burden associated with digital engagement.

However, existing research often simplifies the relationship between technology use and mental health by focusing primarily on-screen time duration. This approach fails to capture the complexity of digital behaviour. Not all screen time is equal; passive consumption, such as scrolling through social media feeds, may have adverse psychological effects, whereas active engagement, such as learning, creating content, or participating in meaningful online interactions, may contribute positively to well-being.

Furthermore, contextual and behavioural factors such as sleep patterns, physical activity, and mindfulness practices play a crucial role in moderating the effects of digital consumption. For instance, late-night screen usage can disrupt circadian rhythms, leading to sleep deprivation and increased stress levels. Conversely, structured routines and mindful practices may mitigate the negative effects of prolonged digital exposure.

The primary objective of this study is to determine whether the type of digital activity or contextual lifestyle variables serve as stronger predictors of mental health outcomes than raw screen time. By adopting a data-driven approach, this research aims to provide a nuanced understanding of digital well-being and contribute to the development of more effective interventions that emphasize balance, digital hygiene, and holistic lifestyle management.

## **2. METHODOLOGY**

### **A. Sample and Data Collection**

The study is based on a dataset comprising 2,000 unique individuals. The sample includes a diverse demographic distribution, covering a wide age range from adolescents to older adults

and representing different genders and lifestyle backgrounds. This diversity enhances the generalizability of the findings and allows for a broader understanding of digital behaviour across populations.

## **B. Variables**

The study examines multiple variables categorized as follows:

### **1. Independent Variables:**

- Daily screen time (hours)
- Device usage (phone and laptop)
- Content type (social media, gaming, professional/work-related use)

### **2. Dependent Variables:**

- Mental health scores (range: 20–80)
- Stress levels (scale: 1–10)
- Weekly anxiety scores
- Depression indicators

### **3. Moderating Variables:**

- Sleep duration and quality
- Physical activity (hours per week)
- Mindfulness practices (minutes per day)

## **C. Analytical Approach**

A quantitative analytical framework was employed using statistical methods. Pearson correlation analysis was conducted to identify relationships between variables. Additionally, descriptive statistics and data visualizations (heatmaps, scatter plots, and boxplots) were used to interpret behavioural patterns and psychological outcomes.

### **3. RESULTS AND KEY FINDINGS**

#### **A. Descriptive Statistics**

The dataset reveals that the average mental health score is 49.65, suggesting moderate psychological well-being among participants. The average screen time of 6.02 hours indicates that digital engagement is deeply embedded in daily routines.

The largest user group (1,355 individuals) falls within the moderate usage category (4–8 hours). This group maintains relatively stable mental health scores, suggesting that moderate digital usage may represent a balanced integration of work and leisure activities.

#### **B. The Stability of Moderate Use**

Moderate users demonstrate consistent mental health outcomes, indicating that this level of digital engagement has become normalized. It likely reflects a combination of essential digital activities and controlled recreational use that does not significantly disrupt psychological stability.

#### **C. High Usage and the “Active Use” Hypothesis**

Interestingly, users in the high usage category (8–12 hours) do not consistently report higher anxiety levels. This finding challenges the assumption that increased screen time directly correlates with negative mental health outcomes.

Instead, it supports the “Active Use” hypothesis, which suggests that the nature of engagement matters more than duration. Users involved in productive or interactive activities—such as gaming communities, professional work, or content creation—may experience a sense of purpose and social connection, reducing psychological distress.

### **4. PROTECTIVE FACTORS AND RESILIENCE**

#### **A. Sleep as a Critical Buffer**

One of the most significant findings of this study is the role of sleep as a protective factor. A strong inverse correlation exists between sleep quality and stress levels. Individuals who maintain healthy sleep durations (6–8 hours) exhibit better mental health outcomes, regardless of screen time.

Sleep disruption, often caused by late-night device usage, is strongly associated with increased stress and anxiety. This suggests that the negative effects of digital consumption may be mediated through physiological mechanisms such as circadian rhythm disruption rather than direct psychological impact.

### **B. Mindfulness and Cognitive Recovery**

Mindfulness practices, even at modest levels (approximately 20–25 minutes daily), show a positive impact on mental health. These practices provide a form of cognitive reset, helping individuals manage overstimulation caused by prolonged digital exposure.

### **C. Physical Activity**

Physical activity also emerges as a significant contributor to mental well-being. Individuals who engage in regular exercise demonstrate lower stress levels and higher mental health scores, highlighting the importance of maintaining a balanced lifestyle.

## **5. DATA VISUALIZATION INSIGHTS**

### **A. Correlation Heatmap**

The heatmap analysis reveals strong inverse relationships between sleep quality and stress levels. It also indicates that while screen time has a measurable effect on mental health, its impact is less pronounced compared to sleep and mindfulness.

### **B. Scatter Plot Analysis**

The scatter plot of screen time versus mental health scores demonstrates high variability. Individuals with similar screen time levels exhibit widely different psychological outcomes, reinforcing the argument that screen time alone is an insufficient predictor.

### **C. Stress Distribution Across Usage Categories**

The boxplot analysis shows that stress levels peak within moderate and high usage categories but tend to plateau rather than increase linearly. The presence of outliers—individuals with high screen time but low stress—highlights the importance of protective behaviours.

## 6. DISCUSSION

The findings of this study reveal several important patterns that deepen our understanding of the relationship between digital consumption and psychological well-being.

First, the concept of the “Goldilocks” effect highlights the non-linear nature of this relationship. Rather than demonstrating a simple increase or decrease in mental health outcomes with rising screen time, the results indicate that both minimal and excessive usage correspond to distinct psychological profiles. Moderate usage, typically within the 4–8-hour range, appears to provide a balance between productivity and leisure, resulting in relatively stable mental health outcomes. This suggests that a certain level of digital engagement is not only unavoidable but may also be beneficial when integrated appropriately into daily routines.

Second, the sleep-stress loop emerges as a critical mechanism influencing mental health. Increased screen exposure, especially during late-night hours, disrupts sleep patterns by affecting circadian rhythms and reducing overall sleep quality. This, in turn, leads to elevated stress levels, creating a reinforcing feedback cycle. The findings emphasize that the negative effects of screen time are often indirect, mediated through sleep deprivation rather than direct psychological harm.

Finally, the distinction between passive and active digital consumption provides a key insight for understanding user behaviour. Passive activities, such as prolonged social media browsing, are linked to higher stress and reduced well-being, likely due to comparison-driven and repetitive content exposure. In contrast, active engagement—such as learning, content creation, or interactive participation—can foster a sense of purpose, thereby supporting mental health. These insights underline the need for targeted and behaviour-focused digital interventions.

## 7. RECOMMENDATIONS

Based on the findings of this study, several practical recommendations can be proposed to promote healthier digital habits and improve psychological well-being. First, there is a critical need to **promote digital hygiene** by encouraging structured and intentional technology use. Individuals should be guided to establish boundaries around screen usage, particularly during late-night hours, in order to protect sleep quality and maintain circadian rhythm stability.

Simple practices such as device curfews, blue-light filters, and scheduled “offline” periods can significantly reduce the negative physiological impacts of excessive screen exposure.

Second, the focus should shift from merely reducing screen time to improving the **quality of digital engagement**. Not all digital interactions are harmful; therefore, users should be encouraged to engage in meaningful and productive activities such as learning, content creation, or professional work, rather than passive consumption like endless scrolling. This qualitative approach can enhance cognitive engagement and reduce stress.

Third, incorporating **mindfulness practices** into daily routines is essential for mitigating digital overstimulation. Even brief sessions of meditation, breathing exercises, or digital detox intervals can help restore mental balance and improve emotional regulation.

Additionally, promoting **regular physical activity** is crucial, as it serves as a natural counterbalance to sedentary digital lifestyles. Exercise has been shown to reduce stress, improve mood, and enhance overall mental resilience.

Finally, there is a need to **design smarter digital interventions** at institutional and technological levels. Rather than imposing strict screen-time restrictions, digital wellness programs should emphasize behavioural balance, self-awareness, and sustainable habits, enabling users to achieve a healthier and more productive relationship with technology.

## **8. CONCLUSION**

This study presents a comprehensive quantitative analysis of the relationship between digital technology consumption and psychological well-being, offering important insights into the evolving nature of human interaction with digital environments. In contrast to traditional assumptions that primarily associate increased screen time with negative mental health outcomes, the findings of this research demonstrate that the relationship is far more complex, multidimensional, and context-dependent. Rather than functioning as a direct predictor, screen time emerges as a variable whose impact is significantly moderated by behavioural patterns, lifestyle factors, and the qualitative nature of digital engagement.

One of the most significant contributions of this study is the identification of behavioural context as a critical determinant of mental health outcomes. Variables such as sleep quality, mindfulness practices, and physical activity were found to play a far more influential role than the sheer duration of screen exposure. In particular, sleep quality emerged as the most powerful

buffering factor against stress and psychological distress. The analysis clearly indicates that individuals who maintain consistent and sufficient sleep cycles—typically within the range of 6 to 8 hours—exhibit greater emotional stability and resilience, even when engaged in high levels of digital activity. This finding reinforces the hypothesis that the negative effects commonly attributed to screen time may, in many cases, be indirectly mediated through physiological disruptions such as circadian rhythm imbalance rather than direct psychological harm.

Furthermore, the study highlights the importance of distinguishing between different types of digital engagement. The results support the notion that not all screen time is inherently detrimental. Passive forms of digital consumption, such as prolonged social media scrolling or content bingeing, are more likely to be associated with increased stress, anxiety, and negative self-perception. In contrast, active and purposeful digital activities—such as content creation, professional work, learning, or participation in interactive communities—can foster a sense of achievement, social connection, and cognitive engagement. This distinction underscores the need to move beyond simplistic, time-based metrics and adopt a more nuanced understanding of digital behaviour.

The concept of a “digital diet,” as introduced in this study, provides a useful framework for interpreting these findings. Much like nutritional intake, digital consumption should be evaluated not only in terms of quantity but also in terms of quality, balance, and timing. A healthy digital diet does not necessarily require strict limitations or complete avoidance of screen-based activities; instead, it emphasizes intentionality, moderation, and the integration of restorative practices. This perspective shifts the focus from restriction to optimization, encouraging individuals to develop mindful and balanced digital habits that align with their psychological and physiological needs.

Another key implication of this research is the role of mindfulness and cognitive recovery practices in mitigating the potential negative effects of digital exposure. Even relatively short durations of daily mindfulness activity—such as meditation, breathing exercises, or digital detox intervals—were associated with improved mental health scores and reduced stress levels. These practices act as cognitive reset mechanisms, helping individuals manage the overstimulation and information overload that often accompany prolonged digital engagement. Similarly, physical activity was found to contribute positively to psychological well-being,

reinforcing the importance of maintaining a holistic lifestyle that balances digital and offline experiences.

The findings of this study also have important implications for policy-making, education, and digital platform design. For educators and academic institutions, the results suggest that student well-being initiatives should focus not only on reducing screen time but also on promoting healthy digital habits, sleep hygiene, and stress management techniques. For policymakers, the study highlights the need for evidence-based guidelines that reflect the complexity of digital behaviour rather than relying on generalized screen-time limits. Additionally, technology developers and platform designers can play a crucial role by incorporating features that encourage mindful usage, such as usage tracking, break reminders, and tools that promote active rather than passive engagement.

Despite its contributions, this study is not without limitations. The reliance on cross-sectional data restricts the ability to establish causal relationships between variables. While correlations provide valuable insights into associations, they do not fully capture the dynamic and evolving nature of digital behaviour and its long-term psychological effects. Furthermore, self-reported measures of screen time, sleep, and mental health may be subject to reporting biases, which could influence the accuracy of the findings. Future research should address these limitations by employing longitudinal designs that track behavioural changes over time and experimental approaches that allow for controlled investigation of cause-and-effect relationships.

In addition, future studies could explore the role of emerging technologies such as artificial intelligence, virtual reality, and immersive digital environments in shaping mental health outcomes. As digital ecosystems continue to evolve, it is essential to understand how new forms of interaction may influence psychological well-being. Investigating demographic variations, cultural differences, and individual personality traits could also provide deeper insights into how different populations respond to digital exposure.

In conclusion, this study challenges the dominant narrative that equates increased screen time with declining mental health. Instead, it advocates for a more sophisticated and holistic understanding of digital well-being, one that recognizes the interplay between behavioural patterns, lifestyle factors, and the qualitative aspects of digital engagement. The concept of a balanced digital diet emerges as a central theme, emphasizing the importance of intentional, mindful, and context-aware technology use. By prioritizing sleep, encouraging active

engagement, and integrating restorative practices, individuals can navigate the digital landscape in a way that supports rather than undermines their psychological well-being. Ultimately, this research contributes to a growing body of knowledge that seeks to redefine the relationship between humans and technology, offering practical guidance for achieving sustainable digital balance in an increasingly connected world.

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