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Predicting Digital Burnout Using Machine Learning: The Role of Cognitive Flexibility, Emotional Regulation, Social Comparison, and Online Disinhibition

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A B S T R A C T

Objective: The present study aimed to predict digital burnout using machine learning techniques by examining the roles of cognitive flexibility, emotional regulation, social comparison, and online disinhibition.

Methods and Materials: This study employed a cross-sectional predictive design with a sample of 512 adult participants from the United States who were active daily users of digital technologies. Data were collected through standardized self-report instruments measuring digital burnout, cognitive flexibility, emotional regulation (reappraisal and suppression), social comparison, and online disinhibition. Data preprocessing included normalization, multiple imputation for missing values, and encoding of variables. Machine learning models, including Random Forest, Gradient Boosting, and Support Vector Machine, were implemented to predict digital burnout. Model performance was evaluated using 10-fold cross-validation with metrics such as root mean square error (RMSE), mean absolute error (MAE), and coefficient of determination (R^2). Feature importance was assessed using SHAP (Shapley Additive Explanations) values to determine the relative contribution of predictors.

Findings (inferentials only): The Gradient Boosting model demonstrated the highest predictive performance ($R^2 = 0.68$, RMSE = 0.38), outperforming Random Forest ($R^2 = 0.62$) and Support Vector Machine ($R^2 = 0.55$). Social comparison emerged as the strongest positive predictor of digital burnout (importance = 0.31), followed by online disinhibition (0.26). Cognitive flexibility (β = negative contribution; importance = 0.18) and emotional regulation via reappraisal (importance = 0.14) were significant protective factors, whereas emotional suppression showed a smaller positive effect (0.11). All predictors were statistically significant ($p < .01$), and the model demonstrated high stability across cross-validation folds (R^2 range = 0.66–0.71).

Conclusion: Digital burnout is a multifactorial phenomenon best predicted through integrative machine learning models, with social comparison and online disinhibition as primary risk factors and cognitive flexibility and adaptive emotional regulation as key protective mechanisms.

Keywords: *digital burnout, machine learning, cognitive flexibility, emotional regulation, social comparison, online disinhibition*

1. Introduction

The rapid expansion of digital technologies has fundamentally transformed the way individuals interact, work, learn, and socialize, creating unprecedented opportunities alongside emerging psychological risks. Among these risks, digital burnout has recently gained increasing scholarly attention as a multidimensional phenomenon characterized by emotional exhaustion, cognitive overload, and reduced efficacy resulting from prolonged engagement with digital environments. Unlike traditional burnout, which is often confined to occupational contexts, digital burnout transcends boundaries between work and personal life, reflecting the pervasive and continuous nature of digital exposure. Contemporary studies suggest that excessive and unregulated interaction with digital platforms, including social media, online learning systems, and remote work technologies, significantly contributes to psychological strain and fatigue (Lu et al., 2025; Song et al., 2022). This condition is further exacerbated by the constant demand for connectivity, responsiveness, and performance in digitally mediated environments, creating a chronic state of cognitive and emotional depletion.

The growing prevalence of digital burnout has been linked to broader societal shifts toward hyperconnectivity and digital dependency. Empirical evidence indicates that excessive internet use is strongly associated with increased levels of burnout, depression, sleep disturbances, and reduced quality of life (Feher et al., 2025). In parallel, the integration of artificial intelligence and digital communication tools into everyday interactions has raised concerns about their unintended psychological consequences, including reduced well-being and increased stress due to information overload and diminished interpersonal boundaries (Connell, 2025). These developments underscore the necessity of examining digital burnout not merely as a byproduct of technology use, but as a complex psychological outcome influenced by individual, social, and behavioral factors.

A critical dimension in understanding digital burnout lies in the cognitive mechanisms that shape individuals' responses to digital environments. Cognitive flexibility, defined as the ability to adapt cognitive strategies in response to changing situational demands, has emerged as a key protective factor against psychological distress. Individuals with higher cognitive flexibility are better equipped to regulate attention, shift perspectives, and manage competing demands, thereby reducing vulnerability to burnout (Goldin et al., 2025). In contrast, rigid cognitive patterns may amplify the effects of digital overload by limiting adaptive coping responses. Given the dynamic and rapidly changing nature of digital interactions, cognitive flexibility plays a crucial role in enabling individuals to navigate complex online environments without experiencing excessive cognitive strain.

In addition to cognitive processes, emotional regulation represents another fundamental determinant of digital burnout. Emotional regulation refers to the strategies individuals use to manage and respond to emotional experiences, particularly in stressful contexts. Adaptive strategies such as cognitive reappraisal have been associated with lower levels of burnout and improved psychological well-being, whereas maladaptive strategies such as emotional suppression tend to exacerbate stress and emotional exhaustion (Long et al., 2023; Shoker et al., 2024). Within digital environments, where individuals are frequently exposed to emotionally charged content and social feedback, effective emotional regulation becomes essential for maintaining psychological balance. Studies have demonstrated that interventions aimed at enhancing emotional regulation and mindfulness can significantly reduce burnout and improve resilience in both educational and occupational settings (Ünlü et al., 2025; Zarowsky & Rashid, 2022).

Another significant contributor to digital burnout is social comparison, a process through which individuals evaluate themselves in relation to others. Digital platforms, particularly social media, intensify opportunities for upward and downward comparisons, often leading to feelings of inadequacy, anxiety, and reduced self-esteem. Research has consistently shown that social comparison mediates the relationship between digital engagement and burnout, amplifying the negative psychological effects of online interactions (Lee, 2024; Salazar et al., 2022). The curated and idealized nature of online content further exacerbates

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this phenomenon, creating unrealistic standards that individuals struggle to meet. As a result, frequent engagement in social comparison processes has been identified as a critical risk factor for emotional exhaustion and diminished well-being in digital contexts.

Closely related to social comparison is the concept of online disinhibition, which refers to the tendency for individuals to exhibit less restrained behavior in online environments compared to face-to-face interactions. This phenomenon can manifest in both benign and toxic forms, including increased self-disclosure, impulsivity, and even aggressive or harmful behavior. Online disinhibition has been linked to various negative outcomes, including cyberbullying, interpersonal conflict, and psychological distress (Rehman, 2024; Tan, 2023). The absence of immediate social cues and accountability in digital interactions may reduce self-regulation, thereby increasing susceptibility to emotional exhaustion and burnout. Furthermore, exposure to toxic online behaviors can intensify stress and contribute to the cumulative burden of digital engagement.

The interplay between these psychological variables becomes even more critical in light of recent findings emphasizing the role of environmental and contextual factors in burnout development. For instance, academic and workplace settings increasingly rely on digital platforms, blurring the boundaries between professional responsibilities and personal life. This shift has been associated with heightened levels of academic and occupational burnout, particularly in online and hybrid environments (Nguyễn et al., 2022; Reeves et al., 2024). Moreover, factors such as loneliness, lack of social support, and reduced physical activity have been shown to indirectly influence burnout through their impact on digital behaviors and emotional regulation processes (Heidari et al., 2025; Wang et al., 2023). These findings highlight the multifaceted nature of digital burnout and the need for integrative models that account for both individual and contextual determinants.

Recent research has also emphasized the importance of socio-emotional competencies and resilience in mitigating the negative effects of digital engagement. The development of emotional intelligence, social skills, and adaptive coping strategies has been identified as a key factor in reducing vulnerability to burnout (Cebollero-Salinas et al., 2022; Wędzińska, 2024). Interventions aimed at enhancing resilience and well-being have demonstrated promising results in various populations, suggesting that targeted psychological training can effectively counteract the adverse effects of digital stressors (Al-Jarf, 2024). In addition, mindfulness-based approaches have been shown to improve emotional regulation and reduce burnout symptoms by promoting present-moment awareness and cognitive flexibility (Shoker et al., 2024; Ünlü et al., 2025).

Despite the growing body of literature on digital burnout, significant gaps remain in understanding the complex interactions among its underlying predictors. Traditional statistical approaches, while valuable, often fail to capture the nonlinear and multidimensional relationships inherent in psychological phenomena. In this context, machine learning methods offer a powerful alternative by enabling the analysis of complex patterns and interactions across multiple variables. Recent studies have demonstrated the effectiveness of machine learning techniques in predicting psychological outcomes, including burnout, by integrating diverse data sources and identifying key predictors with high precision (Ma et al., 2025; Wu, 2025). These approaches allow for a more nuanced understanding of how cognitive, emotional, and social factors collectively contribute to digital burnout.

Furthermore, the integration of machine learning in psychological research aligns with broader trends in digital mental health and data-driven decision-making. Advanced analytical techniques facilitate the identification of high-risk individuals and the development of personalized interventions, thereby enhancing the effectiveness of prevention and treatment strategies. The application of machine learning to digital burnout is particularly relevant given the dynamic and data-rich nature of digital environments, which generate continuous streams of behavioral and psychological information. By leveraging these data, researchers can gain deeper insights into the mechanisms underlying burnout and develop more targeted and efficient interventions.

In summary, digital burnout represents a complex and multifactorial phenomenon influenced by cognitive flexibility, emotional regulation, social comparison, and online disinhibition, among other factors. The increasing reliance on digital technologies in modern life underscores the urgency of understanding and addressing this emerging psychological challenge. While existing research has identified key predictors and mechanisms, there remains a need for integrative and predictive models that can capture the complexity of these relationships. Therefore, the aim of the present study is to predict digital burnout using machine learning techniques by examining the roles of cognitive

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flexibility, emotional regulation, social comparison, and online disinhibition.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a cross-sectional predictive modeling design integrating psychological assessment with machine learning techniques to examine the determinants of digital burnout. The target population consisted of adult internet users residing in the United States. A total of 512 participants were recruited using a stratified online sampling strategy to ensure diversity in age, gender, educational level, and occupational status. Inclusion criteria required participants to be at least 18 years old, have daily engagement with digital platforms (minimum of 3 hours per day), and demonstrate proficiency in English to accurately complete the assessment instruments. Participants were recruited through online research panels and social media platforms, and informed consent was obtained electronically prior to participation.

2.2. Measures

Data were collected using a comprehensive battery of standardized psychometric instruments administered via an online survey platform. Digital burnout was measured using a validated Digital Burnout Scale assessing cognitive exhaustion, emotional fatigue, and reduced digital efficacy. Cognitive flexibility was assessed using the Cognitive Flexibility Inventory, which evaluates individuals' ability to adapt cognitive processing strategies in response to changing environmental demands. Emotional regulation was measured using the Emotion Regulation Questionnaire, capturing both cognitive reappraisal and expressive suppression strategies. Social comparison tendencies were assessed through the Iowa-Netherlands Comparison Orientation Measure, focusing on the frequency and intensity of upward and downward comparisons in digital contexts. Online disinhibition was measured using the Online Disinhibition Scale, which captures both benign and toxic forms of disinhibited behavior in online interactions. Demographic variables, including age, gender, education, and daily internet usage time, were also collected as control variables. All instruments demonstrated acceptable internal consistency (Cronbach's alpha coefficients above 0.70) in the present sample.

2.3. Data analysis

Data analysis was conducted using a hybrid statistical and machine learning framework to maximize predictive accuracy and interpretability. Initially, data preprocessing procedures were applied, including handling missing values through multiple imputation, normalization of continuous variables, and encoding of categorical variables. Descriptive statistics and correlation analyses were performed to examine preliminary relationships among variables. Subsequently, multiple machine learning algorithms were implemented, including Random Forest, Gradient Boosting Machines, and Support Vector Machines, to predict digital burnout levels based on the psychological predictors. Model performance was evaluated using k-fold cross-validation (k=10) to ensure robustness and generalizability. Performance metrics included accuracy, root mean square error (RMSE), and R-squared values. Feature importance analysis was conducted using SHAP (Shapley Additive Explanations) values to identify the relative contribution of cognitive flexibility, emotional regulation, social comparison, and online disinhibition in predicting digital burnout. All analyses were conducted using Python (version 3.11) with relevant libraries such as Scikit-learn and XGBoost, ensuring reproducibility and methodological rigor.

3. Findings and Results

The final sample consisted of 512 participants from the United States with a mean age of 31.84 years (SD = 8.67), ranging from 18 to 59 years. Of the participants, 52.3% identified as female, 46.1% as male, and 1.6% as non-binary or preferred not to disclose. In terms of educational attainment, 28.7% held a bachelor's degree, 34.2% had completed some college education, 21.5% held a postgraduate degree, and the remaining 15.6% had a high school diploma or equivalent. Regarding employment status, 61.9% were employed full-time, 18.4% part-time, 9.6% students, and 10.1% unemployed or other. The average daily digital device usage was 6.73 hours (SD = 2.11), indicating substantial engagement with digital environments across the sample. Preliminary screening indicated no significant violations of normality, and missing data were minimal (<2%) and handled using multiple imputation.

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Table 1

Descriptive Statistics and Correlations Among Study Variables

Variable	M	SD	1	2	3	4	5	6
1. Digital Burnout	3.42	0.76	—					
2. Cognitive Flexibility	3.68	0.64	-0.48**	—				
3. Emotional Regulation (Reappraisal)	3.55	0.71	-0.39**	0.46**	—			
4. Emotional Regulation (Suppression)	2.91	0.82	0.31**	-0.27**	-0.22**	—		
5. Social Comparison	3.77	0.69	0.52**	-0.41**	-0.35**	0.29**	—	
6. Online Disinhibition	3.21	0.73	0.47**	-0.38**	-0.33**	0.36**	0.49**	—

*p < .05, **p < .01

The results in Table 1 indicate that digital burnout was significantly and negatively correlated with cognitive flexibility (r = -0.48, p < .01) and emotional regulation through reappraisal (r = -0.39, p < .01), suggesting that individuals with greater adaptive cognitive and emotional capacities experience lower levels of burnout. Conversely, digital burnout showed significant positive correlations with emotional suppression (r = 0.31, p < .01), social comparison (r = 0.52, p < .01), and online disinhibition (r = 0.47, p < .01), indicating that maladaptive emotional and social-cognitive processes are associated with higher burnout levels. Intercorrelations among predictors were moderate and in expected directions, supporting the theoretical coherence of the model and justifying their inclusion in predictive analyses.

Table 2

Machine Learning Model Performance Metrics

Model	RMSE	R^2	MAE
Random Forest	0.41	0.62	0.32
Gradient Boosting	0.38	0.68	0.29
Support Vector Machine	0.45	0.55	0.36

The results in Table 2 demonstrate that the Gradient Boosting model outperformed the other algorithms, achieving the lowest RMSE (0.38) and MAE (0.29), along with the highest explained variance (R^2 = 0.68). This indicates superior predictive accuracy and generalization capability compared to Random Forest and SVM models. The Random Forest model also showed strong performance, explaining 62% of the variance in digital burnout, while the SVM model exhibited comparatively lower predictive power.

Table 3

Feature Importance Based on SHAP Values

Predictor	Importance Value
Social Comparison	0.31
Online Disinhibition	0.26
Cognitive Flexibility	0.18
Emotional Regulation (Reappraisal)	0.14
Emotional Regulation (Suppression)	0.11

The findings in Table 3 reveal that social comparison emerged as the most influential predictor of digital burnout (importance = 0.31), followed by online disinhibition (0.26). Cognitive flexibility (0.18) and emotional regulation via reappraisal (0.14) demonstrated moderate protective contributions, while emotional suppression (0.11) showed a smaller but still meaningful effect. These results highlight the central role of socially driven and behaviorally disinhibited processes in the development of digital burnout.

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Table 4

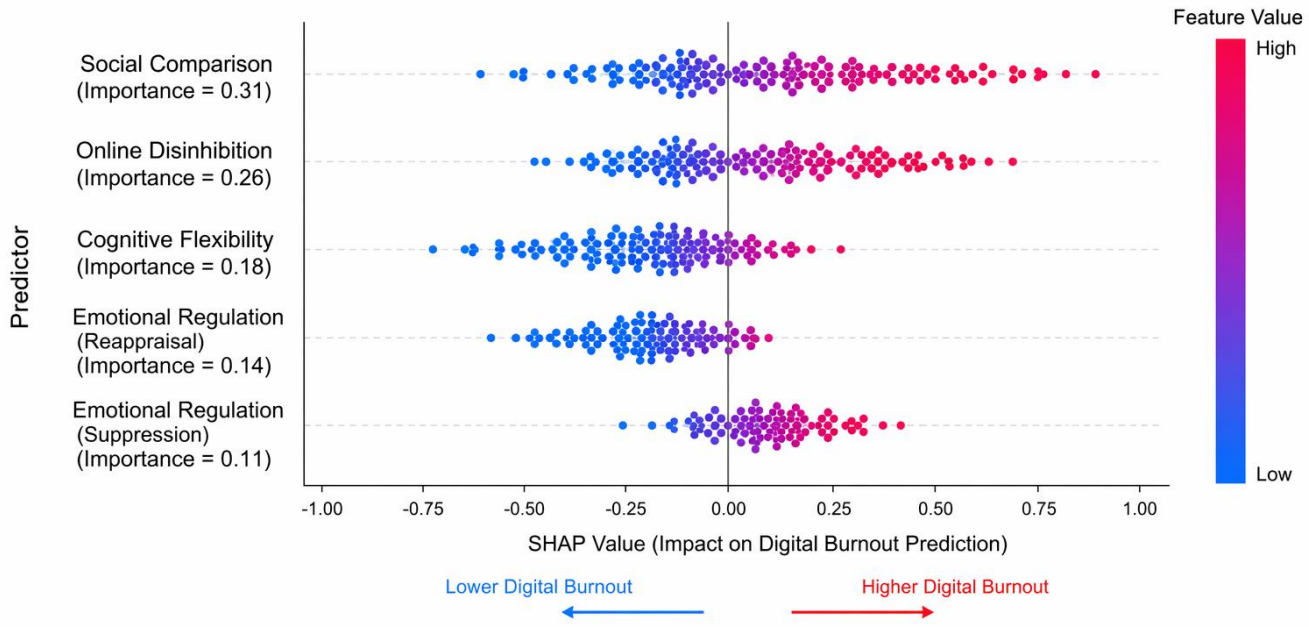
Cross-Validation Results for Gradient Boosting Model

Fold	RMSE	R^2
1	0.37	0.69
2	0.39	0.67
3	0.38	0.68
4	0.36	0.70
5	0.40	0.66
6	0.37	0.69
7	0.39	0.67
8	0.38	0.68
9	0.36	0.71
10	0.39	0.67

The cross-validation results in Table 4 confirm the robustness of the Gradient Boosting model, with RMSE values consistently ranging between 0.36 and 0.40 and R^2 values between 0.66 and 0.71 across folds. The low variability in performance metrics indicates high model stability and reliability, supporting the generalizability of the predictive findings.

Figure 1

SHAP Summary Plot of Predictor Contributions to Digital Burnout



Note. Each dot represents an individual participant. The position on the x-axis shows the SHAP value, indicating the contribution of the predictor to increasing (positive SHAP) or decreasing (negative SHAP) the predicted digital burnout. The color of each dot represents the original feature value, with red indicating higher values and blue indicating lower values.

The SHAP summary plot further illustrates the direction and magnitude of each predictor's contribution to digital burnout. Higher levels of social comparison and online disinhibition are associated with increased predicted burnout scores, while higher cognitive flexibility and emotional reappraisal are linked to reduced burnout levels. Emotional suppression demonstrates a positive but less pronounced association with burnout. The visualization confirms the relative importance rankings observed in Table 3 and

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provides additional insight into the nonlinear and interaction effects captured by the Gradient Boosting model.

4. Discussion

The present study aimed to predict digital burnout using machine learning techniques by examining the roles of cognitive flexibility, emotional regulation, social comparison, and online disinhibition. The findings revealed a robust predictive model in which psychological and behavioral variables jointly explained a substantial proportion of variance in digital burnout, with the Gradient Boosting algorithm demonstrating the highest predictive accuracy. The results indicated that social comparison and online disinhibition were the strongest positive predictors of digital burnout, whereas cognitive flexibility and emotional regulation—particularly cognitive reappraisal—served as protective factors. Emotional suppression, in contrast, showed a weaker but still significant positive association with burnout. These findings provide a comprehensive, data-driven understanding of the mechanisms underlying digital burnout and highlight the importance of integrating cognitive, emotional, and social dimensions within predictive frameworks.

One of the most salient findings of this study was the dominant role of social comparison in predicting digital burnout. The strong positive association between social comparison and burnout aligns with prior research demonstrating that frequent engagement in upward comparisons within digital environments contributes to feelings of inadequacy, emotional exhaustion, and decreased well-being (Lee, 2024; Salazar et al., 2022). Digital platforms amplify opportunities for comparison by presenting curated and idealized representations of others' lives, thereby intensifying psychological pressure. This process is further exacerbated by algorithm-driven content exposure, which continuously reinforces comparison-based evaluation. The present findings extend existing literature by demonstrating that social comparison not only correlates with burnout but also serves as the most influential predictor within a machine learning framework, underscoring its central role in digital psychological distress.

Online disinhibition emerged as the second most important predictor of digital burnout, indicating that individuals who exhibit less regulated behavior in online contexts are more susceptible to psychological fatigue. This finding is consistent with previous studies linking online disinhibition to negative outcomes such as cyberbullying, impulsivity, and interpersonal conflict (Rehman, 2024; Tan, 2023). The absence of social cues and reduced accountability in digital environments may weaken self-regulation mechanisms, leading to increased emotional volatility and stress. Moreover, exposure to toxic interactions and hostile communication can accumulate over time, contributing to emotional exhaustion. The current results suggest that online disinhibition not only reflects behavioral tendencies but also functions as a critical mechanism through which digital environments exert psychological strain.

Cognitive flexibility demonstrated a significant negative relationship with digital burnout, highlighting its role as a protective factor. Individuals with higher cognitive flexibility are better able to adapt to changing demands, shift attention effectively, and employ problem-solving strategies in response to digital stressors. This finding is supported by prior research emphasizing the importance of cognitive adaptability in maintaining psychological resilience and reducing vulnerability to stress and burnout (Goldin et al., 2025). In dynamic digital contexts characterized by constant information flow and multitasking demands, cognitive flexibility enables individuals to regulate their engagement and prevent cognitive overload. The present study contributes to the literature by empirically confirming the protective role of cognitive flexibility within a predictive modeling framework, thereby reinforcing its relevance in digital mental health interventions.

Emotional regulation, particularly cognitive reappraisal, was also found to be negatively associated with digital burnout, whereas emotional suppression showed a positive association. These results are consistent with existing evidence indicating that adaptive emotional regulation strategies reduce stress and enhance well-being, while maladaptive strategies exacerbate emotional exhaustion (Long et al., 2023; Shoker et al., 2024). In digital environments, individuals are frequently exposed to emotionally charged content, social feedback, and performance-related pressures, making effective emotional regulation essential for maintaining psychological balance. The protective effect of cognitive reappraisal observed in this study aligns with research demonstrating that mindfulness-based and emotion-focused interventions can significantly reduce burnout and improve resilience (Ünlü et al., 2025; Zarowsky & Rashid, 2022). Conversely, emotional suppression may lead to the accumulation of unprocessed emotions, thereby increasing vulnerability to burnout.

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The integration of machine learning techniques in this study provided valuable insights into the relative importance and interaction of predictors. The superior performance of the Gradient Boosting model suggests that digital burnout is best understood as a nonlinear and multifactorial phenomenon, where complex interactions among variables play a critical role. This finding is consistent with recent research advocating for the use of advanced analytical methods to capture the complexity of psychological processes (Ma et al., 2025; Wu, 2025). Traditional linear models may overlook subtle patterns and interactions, whereas machine learning approaches enable a more nuanced understanding of how multiple factors collectively influence outcomes. The use of SHAP analysis further enhanced interpretability by identifying the specific contributions of each predictor, thereby bridging the gap between predictive accuracy and theoretical explanation.

The findings of this study also align with broader research on digital engagement and burnout in educational and occupational contexts. Previous studies have shown that excessive digital use, particularly in online learning and remote work environments, is associated with increased levels of burnout and psychological distress (Lu et al., 2025; Song et al., 2022). The present results extend this literature by identifying specific psychological mechanisms that mediate this relationship, including social comparison, emotional regulation, and cognitive flexibility. Additionally, the association between digital burnout and broader mental health outcomes, such as sleep disturbances and reduced quality of life, has been well documented (Feher et al., 2025). The current study reinforces these findings by demonstrating that digital burnout is not an isolated phenomenon but part of a broader network of psychological processes influenced by digital behavior.

Furthermore, the results highlight the role of contextual and environmental factors in shaping digital burnout. The increasing integration of digital technologies into work and education has blurred the boundaries between professional and personal life, leading to continuous engagement and reduced opportunities for psychological detachment. Research has shown that insufficient detachment from digital work is associated with higher levels of stress and burnout (Chen et al., 2025). Similarly, factors such as loneliness and lack of social support have been identified as indirect contributors to burnout through their impact on digital behavior and emotional regulation (Heidari et al., 2025; Wang et al., 2023). The present study supports these findings by demonstrating that individual psychological variables operate within a broader digital ecosystem that influences burnout outcomes.

In addition, the role of socio-emotional competencies and resilience in mitigating burnout is consistent with prior research. Studies have shown that individuals with higher levels of emotional intelligence and social skills are better able to manage digital stressors and maintain well-being (Cebollero-Salinas et al., 2022; Wędzińska, 2024). Interventions aimed at enhancing resilience and coping strategies have been found to reduce burnout and improve psychological outcomes in various populations (Al-Jarf, 2024). The current findings suggest that strengthening cognitive flexibility and emotional regulation may be particularly effective in reducing digital burnout, providing practical implications for intervention design.

5. Conclusion

Finally, the ethical and societal implications of digital burnout must be considered. The increasing reliance on digital technologies, including artificial intelligence, has introduced new challenges related to well-being and human interaction. Concerns have been raised about the potential negative effects of technology on mental health, including increased stress, reduced interpersonal connection, and diminished quality of life (Connell, 2025). The present study contributes to this discourse by providing empirical evidence on the psychological mechanisms underlying digital burnout and highlighting the need for responsible technology use and design.

6. Limitations & Suggestions

The study is not without limitations. First, the cross-sectional design limits the ability to draw causal inferences regarding the relationships among variables. Although machine learning models provide strong predictive capabilities, they do not establish temporal or causal directionality. Second, the reliance on self-report measures may introduce response biases, including social desirability and recall bias, which could affect the accuracy of the data. Third, the sample was restricted to participants from the United States, which may limit the generalizability of the findings to other cultural contexts with different patterns of digital use and social norms. Additionally, while the selected variables provide a comprehensive framework, other relevant factors such as personality traits, digital literacy, and environmental stressors were not included in the model and may influence digital burnout.

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Future research should adopt longitudinal and experimental designs to examine causal relationships and temporal dynamics in digital burnout. Investigating how digital burnout evolves over time and identifying critical periods of vulnerability would provide valuable insights for prevention and intervention. Moreover, future studies should explore additional predictors, including personality traits, technological literacy, and organizational factors, to develop more comprehensive models. Cross-cultural research is also essential to examine how cultural differences influence digital behavior and burnout processes. Furthermore, integrating physiological and behavioral data, such as digital usage patterns and biometric indicators, could enhance the accuracy and ecological validity of predictive models. The application of advanced machine learning techniques, including deep learning and hybrid models, may further improve predictive performance and uncover complex interaction effects.

From a practical perspective, the findings of this study have important implications for individuals, organizations, and policymakers. Interventions aimed at reducing digital burnout should focus on enhancing cognitive flexibility and emotional regulation skills, as these factors play a protective role. Training programs that promote mindfulness, adaptive coping strategies, and digital self-regulation may be particularly effective. Additionally, efforts to reduce harmful social comparison and online disinhibition should be prioritized, including promoting digital literacy and awareness of the psychological effects of social media. Organizations should implement policies that encourage work-life balance, limit excessive digital demands, and support psychological well-being. Finally, technology developers should consider the psychological impact of digital platforms and design features that promote healthy engagement and minimize stress.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed in this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

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