ISSN Online: 3006-4708
ISSN Print: 3006-4694
SOCIAL SCIENCE REVIEW ARCHIVES
https://policyjournalofms.com

Unraveling the Path from Digital Fatigue to Workplace Thriving: A Serial Mediation Model Based on the Job Demands–Resources Framework

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DOI: https://doi.org/10.70670/sra.v3i4.2077

Abstract
The widespread integration of digital technologies has heightened employees' exposure to incessant connectivity and information overload, increasing the risk of digital fatigue and compromising sustainable work performance. Utilizing Job Demands–Resources (JD-R) theory, this study investigates the impact of digital fatigue on workplace thriving via the sequential mediating roles of cognitive depletion and digital recovery self-efficacy. We gathered time-lagged survey data from 245 employees who worked in four- and five-star hotels in major cities in Pakistan. We then used PLS-SEM to look at the data. The findings reveal that digital fatigue negatively affects workplace thriving and positively anticipates cognitive depletion. Cognitive depletion consequently reduces employees' digital recovery self-efficacy, while digital recovery self-efficacy positively correlates with workplace thriving. Crucially, the results validate an important sequential mediation pathway that reduces recovery-related beliefs and cognitive depletion, which are two ways that digital fatigue undermines thriving. In addition to highlighting digital recovery self-efficacy as a crucial psychological resource for maintaining employee vitality and learning, this study applies JD-R theory to digitally intensive work contexts.

Keywords: Digital fatigue; Workplace thriving; Cognitive depletion; Digital recovery self-efficacy; Job Demands–Resources (JD-R) theory; Digital work environments

Introduction

The rapid and comprehensive adoption of information and communication technology (ICT) has changed the modern workplace setting greatly, enabling unprecedented productivity levels, remote teamwork, and live exchange of data to take place (Gay Querol Leiva, 2025). Modern work has been transforming into an inseparable component of modern working as digital technologies enable us to remain permanently in touch with each other, to share information much faster, and to work anywhere (Knoll et al., 2022). Nevertheless, this massive digitization has a grave disadvantage, namely, the appearance of new psychological pressures due to hyper-connectedness, accessibility, and the blurring of personal and professional lives (Ejaz & Khaliq, 2025). Such continuous exposure might eventually lead to such a phenomenon as digital fatigue, the state of mental and emotional burnout as a result of a constantly extended exposure to digital demands like constant notifications, critical multitasking, and being constantly required to be immediately responsive (Supriyadi et al., 2025). Since digital work becomes a daily or even widespread occurrence, the real-world

effects of digital work are one of the most urgent concerns of both companies and researchers (Kotera & Correa Vione, 2020).

This paper explores the relationship between digital fatigue and workplace thriving, a positive psychological state that will be characterized by the vitality of employees and their continual positive progress at work (Kleine et al., 2023). Employees are frequently expected to manage several digital platforms at once, react fast to electronic interactions, and maintain continuous access as digital technologies continue to influence how work is structured and carried out (Beare et al., 2020). Employees' capacity to maintain energy, focus, and engagement may be hampered by such circumstances, which may progressively worsen digital fatigue (Sholikhah, 2025). It is based on this background that the influence of digital fatigue on workplace thriving comes into effect via the basic cognitive processes and not necessarily through a direct effect alone (Jain et al., 2025a). Cognitive depletion refers to an immediate strain response, which is considered the depletion of mental resources caused by the prolonged digital demands (Rahmi et al., 2025b). Consequently, digital recovery self-efficacy expresses employees' belief in their ability to recuperate, autonomously regulate, and retake control of their work performance in digitally saturated situations (Busse et al., 2022). By integrating the concepts into a single framework, the research is optimistic about comprehending the way digital fatigue results in reduced workplace productivity. In addition to this, since people might vary in how well they can manage the demands of the digital world, age and job experience are also incorporated as control variables to explain the possible variation in adaptability, resilience, and digital coping strategies.

Because digital fatigue has a direct impact on workers' ability to work efficiently and sustainably in contemporary businesses, it is especially crucial to examine its effects (Supriyadi et al., 2025). People assume that workplace thriving, as a vitality and learning indicator, is one of the crucial indicators of long-term performance, flexibility, and welfare of employees (Zhao et al., 2025a). Adaptive and motivated workers would be more prone to future training, which would enable the businesses to keep up with the ever-evolving markets (Spreitzer & Porath, 2012). Nevertheless, the preservation of such pleasant states could be gradually deteriorated by the exhaustion of cognitive resources, emotional engagement, and recovery possibilities, which are caused by chronic digital exhaustion (Jain et al., 2025a; X. Zhang & Deng, 2025a). The workers are exposed to an increasing permeability of the boundaries between the work and the non-work sphere, the increasing pressure on the constant availability, and constant disturbances that disrupt attention as the digital workplace grows more demanding (Bergen & Bressler, 2019). Such conditions may lead to chronic mental fatigue, thus contributing to the possibility that the workers may find it more difficult to keep enthusiastic and demonstrate growth-oriented behaviors in the workplace (Marsh et al., 2024). According to Khusuma & Kodrat (2025a), employee creativity is directly lowered by digital fatigue, which also dramatically raises burnout. According to Sholikhah (2025b), structural organizational risk is created when there is a disparity between the high demands of digital jobs and the lack of digital resources. As Jain et al. (2025a) put it, digital fatigue is a stressful work factor that consumes both emotional and cognitive resources and, if unresolved, may lead to disengagement. Another need to be emphasized by Rahmi et al. (2025b) is the implications of long-term communication through digital tools that could lead to emotional and cognitive burnout and compromise the health and performance of the professionals. Even though the increased understanding of this issue, the amount of profit that organizations would be set to obtain because of the higher productivity rates remains a priority (Marsh et al., 2024). Therefore, creating work systems and management techniques that promote sustainable employee functioning requires an awareness of how digital fatigue compromises workplace thriving. In digitally driven work environments, where employee motivation and development are essential to company success, addressing this issue is more pertinent.

Job Demands–Resources (JD-R) theory (Bakker & Demerouti, 2017), is the theoretical foundation for this study, explaining how digital fatigue functions as a major stressor in current workplace settings. According to the JD-R theory, Job demands that require prolonged physical or psychological effort deplete employees' limited cognitive and emotional resources. This leads to a strain process that impairs motivation, well-being,

and positive functioning (Ling, 2025). The current study extends this framework to the digital context and enhances the stressor approach by considering digital fatigue as a primary digital job demand that results from constant connection, frequent digital disruptions, and constant information overload (Jain et al., 2025a; Sholikhah, 2025). The JD-R theory predicts that continued digital demands must intensify cognitive depletion since it can consume the attentional and self-control resources required to manage the digital work-related tasks (Marsh et al., 2024; Reineke, 2020). Employees may feel less confident in their capacity to recuperate, control effort, and replenish energy in digitally dominated situations when cognitive resources are drained, which leads to a decrease in digital recovery self-efficacy. Although JD-R theory has been commonly applied to the concept of burnout and stress, its role in positive outcomes, such as thriving in the workplace, has received less consideration in past studies (Li et al., 2025). Furthermore, nothing is known about the sequential process that connects cognitive depletion, digital fatigue, and recovery-related attitudes. In order to address this gap, the current study uses JD-R theory to elucidate how interrelated psychological processes undercut workplace thriving due to digital job expectations.

In order to fill the observed theoretical and practical gaps, this study creates and experimentally evaluates a conceptual model that describes how digital fatigue impacts workplace thriving by using the sequential pathways of cognitive depletion and digital recovery self-efficacy. The study specifically peeks into the direct and indirect impact of digital fatigue on workplace thriving, considering diverse variations of age, gender, education, and job experience, through the intellectual and self-regulatory processes of employees. Applying both cognitive depletion and recovery-related self-efficacy perspectives alongside JD-R theory, this research offers a deeper understanding of the role of digital work requirements on the good employee output in modern work settings. The research has theoretically contributed to the literature on JD-R theory in making its application more extensive to a wider range of outcomes on strain and burnout to explain variations in thriving in a digitally intensive workplace. Moreover, focusing on digital recovery self-efficacy as a valuable psychological resource in the maintenance of vitality and learning among the workers when in the constant onslaught of digital demands enriches digital well-being research. Practically, the results give evidence-based concepts to organisations that aim at creating more healthful digital workplaces, which involve dealing with digital workloads, aiding mental recuperation, and improving the self-confidence of personnel members in digital self-regulation. The overall goal of this study is to educate academics and professionals on how to handle the demands of digital work in ways that promote long-term organizational performance and sustainable employee well-being.

Literature Review

Digital Fatigue and Workplace Thriving

A prominent psychological disorder resulting from extensive and extended use of digital devices in the workplace, digital fatigue has been the subject of more and more prior studies (Supriyadi et al., 2025). Based on the JD-R theory (Bakker & Demerouti, 2017; Hamid, 2025), digital fatigue is viewed by researchers as a type of job demand that necessitates constant self-regulation and persistent cognitive effort. The repeated connectedness, information overload, and regular digital disruptions have continued to cause mental exhaustion, reduced attentional capacity, and impaired psychological energy (Guo et al., 2024; Marsh et al., 2024; Rahmi et al., 2025b). However, the notion of workplace thriving, which is characterized by the combined experience of vitality and learning, has long been recognized as a crucial sign of productive employee performance (Abbasi et al., 2025; Kleine et al., 2023). According to prior studies, employees who have thrived are more flexible, adaptive, and capable of sustaining performance with the course of time (Kleine et al., 2023; Porath et al., 2012a; Zhao et al., 2025b). A significant amount of research shows that high job expectations undermine thriving at work by eroding vitality and limiting learning chances. The recent studies in digitally intensive contexts have also asserted that unregulated digital requests result in reduced energy states, less interaction, and poor growth-related attitudes

(Bondanini et al., 2025a; Crawford et al., 2010; Jain et al., 2025a). Overall, this study identifies digital fatigue as a significant job-related stressor and workplace thriving as a major positive outcome driven by employees' psychological resource availability.

There are still a number of significant gaps in the research, despite the rising agreement on the significance of digital fatigue and workplace thriving. First, the majority of the studies on digital fatigue to date have concentrated on adverse consequences like stress, burnout, or strain (Argyriadi et al., 2025; Khusuma & Kodrat, 2025; Marsh et al., 2024; Tell et al., 2023). In contrast, relatively limited attention has been paid to how it affects positive states like workplace thriving (S. Guo et al., 2025; Jain et al., 2025a; Supriyadi et al., 2025). This limits our understanding of the impact of digital pressures not only on malfunction but on the deterioration of learning and vitality as well. Second, previous research has not thoroughly examined the underlying psychological mechanisms since it frequently relies on direct connections (Jain et al., 2025a; Sholikhah, 2025; Supriyadi et al., 2025). To be more exact, the roles of cognitive depletion and recovery-related beliefs have rarely been researched concomitantly as a sequential phenomenon that links digital fatigue to workplace prosperity. Third, although JD-R theory provides a solid ground to explain the relationships between demand and strain, the area of its application to the digital workplace and positive results remains underdeveloped (Marsh et al., 2024; Scholze & Hecker, 2023). Consequently, it is unknown how internal cognitive and self-regulatory mechanisms convert digital job pressures into decreased thriving. It is essential to fill these gaps since it is the reason that the effects of digital fatigue are not only short-term stress but also long-term. The present research contributes to the existing literature by examining the successive role of cognitive depletion and digital recovery self-efficacy, as it gives a more comprehensive account of how digital fatigue impairs thriving at work. Consequently, we postulate the following:

H1: Digital fatigue has a negative effect on workplace thriving.

Digital Fatigue and Cognitive Depletion

Prior studies have looked closely at cognitive depletion as a psychological condition that occurs after prolonged mental exertion and represents the depletion of cognitive and self-regulatory resources (Baumeister et al., 2000; Bray et al., 2008; Schmeichel et al., 2003). Based on resource-based viewpoints and self-regulation theory, researchers commonly concur that people have limited cognitive resources that can be used up while doing activities requiring extended control, attention, and focus (Vohs & Heatherton, 2000). Cognitive depletion has been associated with less self-control, poor decision-making, and decreased attention at the workplace (Dang et al., 2014; Bukhari et al., 2024). Employees' attentional processes are continuously strained in technologically demanding work situations due to frequent digital disruptions, continual information processing, and multitasking (Tams et al., 2015). Empirical studies have identified the following categories of technology-related stressors as associated with escalated levels of mental fatigue and cognitive burden: information overload, rapid task switching, and constant connectedness (Guo et al., 2024; Marsh et al., 2024; Rahmi et al., 2025b). Following this school of thought, the accumulating impact of digital fatigue is caused by the constant digital demands that require long-term cognitive activity (Jain et al., 2025b). According to existing studies, employees' cognitive resources are gradually drained when they are subjected to excessive digital demands over time. This makes it more likely to have attentional failures and mental exhaustion (Argyriadi et al., 2025; Khusuma & Kodrat, 2025b). This body of research on its own offers a substantive conceptual and empirical support to the connection between challenging digital workplace conditions and cognitive depletion.

Even though it is well acknowledged that digital demands need cognitive resources, the literature still has a number of limitations. Some of them look at discrete digital stressors, e.g., multitasking or email overload, rather than defining digital fatigue as a syndrome cumulative after a long time of frequent digital interactions (Jain et al., 2025a; Supriyadi et al., 2025). This disjointed method makes it more difficult to comprehend how long-term digital fatigue results in more severe cognitive impairment. Although cognitive

depletion is frequently viewed as a result of overall work-related stress, its function as a direct result of digital fatigue has not been properly identified or investigated (Sholikhah, 2025; Supriyadi et al., 2025). The studies have rarely placed digital fatigue unequivocally as a work demand in the resource-based theories, even though the theories imply a straightforward demand-depletion relationship (Jain et al., 2025a; Sholikhah, 2025). Because of this, it is difficult to understand how continuous digital fatigue results in diminished cognitive function in contemporary work environments. The gap between these two is crucial as cognitive depletion signifies the point at which the digital demands start taking over the higher-order functioning and eventual outcomes. By explicitly analyzing the link between digital fatigue and cognitive depletion, the current study defines this fundamental stressor approach and expands on previous studies on digital job demands. We therefore suggest the following hypothesis:

H2: Digital fatigue has a positive effect on cognitive depletion.

Cognitive Depletion and Digital Recovery Self-Efficacy

The concept of cognitive depletion used by earlier researchers has been defined as a state of reduced mental functioning due to chronic pressures on attention, self-control, and executive functioning (Brewer et al., 2017; Inzlicht et al., 2014). People with cognitive depletion also complain about difficulties in focusing, controlling themselves, and sustaining effort in all activities (Wagner et al., 2013; Bukhari et al., 2023). On the same note, digital recovery self-efficacy has to do with the belief of employees to overcome digital stress, manage their energy, and manage digital job demands well (Paredes-Aguirre et al., 2025). The self-efficacy theory holds that the belief in the ability to manage and overcome difficult circumstances by people plays a critical role in shaping adaptive behavior and mental well-being (Cassidy, 2015; Kumar & Singh, 2024). The higher self-efficacy has been repeatedly associated with greater perseverance, better coping strategies, and more effective restoration of resources (Black et al., 2018; Freire et al., 2020). Recovery-related self-efficacy has been related in digital working environments to the capacity of workers to get out of work, establish boundaries, and recharge their cognitive and emotional reserves (Paredes-Aguirre et al., 2025; Bukhari & Mujaddid, 2025). Overall, the current amount of knowledge implies that retaining faith in recovery ability is critical for sustaining functioning in situations with high cognitive demands and continuous digital engagement.

Despite these results, the past studies have failed to provide sufficient research on the impact of cognitive depletion on recovery-related self-efficacy, especially in digitally intense jobs. Most research regards self-efficacy as a reasonably steady personal resource, or as an indication to perform and well-being, instead of as an emotional condition that may be damaged by prolonged resource depletion (Chow et al., 2015a; Graham & Bray, 2015). This leaves one of the most crucial gaps in understanding the way in which depleted cognitive resources can undermine the belief of employees to be able to recover and self-regulate. From a resource-based standpoint, cognitive depletion may reduce people's sense of control over their workplace, which might make recuperation more challenging or less possible (Carter et al., 2015; Dang et al., 2014). There is, however, still no empirical evidence establishing a clear correlation between cognitive depletion and digital recovery self-efficacy. This gap needs to be bridged since workers with reduced efficacy of recovery might have a lesser tendency to participate in restorative activities, which might exacerbate the adverse effects of digital demands (Paredes-Aguirre et al., 2025). The current study contributes to our knowledge of how internal strain states impair important psychological resources in digital work situations by investigating cognitive depletion as an antecedent of digital recovery self-efficacy. We therefore suggest the following hypothesis:

H3: Cognitive depletion has a negative effect on digital recovery self-efficacy.

Digital Recovery Self-Efficacy and Workplace Thriving

The importance of self-efficacy as an essential psychological tool that determines the resilience, motivation,

and adaptive functioning of workers in the workplace has been previously discussed (Mishra et al., 2016; Rahadi & Wening, 2025; Wang & Mahmood, 2025). Based on social cognitive theory, researchers generally concur that people are more likely to maintain pleasant work-related moods if they have confidence in their capacity to handle demands and bounce back from stress (Bandura, 2004; Chan et al., 2017). The concept of digital recovery self-efficacy, in this case, is associated with the confidence of the employees in their potential to recycle energy, manage effort, and cope with digital job demands (Paredes-Aguirre et al., 2025). Simultaneously, workplace thriving, which is characterized by the combined experience of vitality and learning, has been generally acknowledged as a desired result linked to long-term growth and sustainable performance (Zhao et al., 2025b). Studies are constantly showing that employees who feel confident about their capabilities are more stimulated, participate more in learning programs (Rahadi & Wening, 2025; Salanova et al., 2011a). Attitudes that can be related to recovery are particularly prevalent in the digitally intensive workplaces where employees must be ready to handle digital boundaries, disruptions, and information excess (Kismono et al., 2025). According to the body of research, self-efficacy is a fundamental human resource that promotes learning and vitality, which in turn promotes workplace thriving.

Despite this agreement, not much research has specifically looked into digital recovery self-efficacy as a unique indicator of succeeding in the workplace. The majority of earlier research ignores the particular difficulties brought on by the demands of digital labor in favor of concentrating on general self-efficacy or job-related efficacy (Paredes-Aguirre et al., 2024; H. Zhang et al., 2025). Therefore, it's still unclear if having trust in digital recovery in particular helps people thrive beyond more general efficacy views. Moreover, recovery-oriented beliefs as a process that sustains vitality and learning in online space have not been adequately studied to date, even though a prosperous state is perceived as a dynamic condition affected by the availability of resources (Jiang et al., 2024; Zhao et al., 2025a). The gap is rather severe as employees who do not feel sure about their ability to overcome the constant digital stress can even possess great technical skills, yet fail to achieve success. The current study builds on previous research on self-efficacy and positive work outcomes by directly connecting digital recovery self-efficacy to workplace thriving. It also explains the role of recovery-related beliefs in maintaining the vitality and advancement of employees amidst the daily pressures of the digital world. We therefore suggest the following hypothesis:

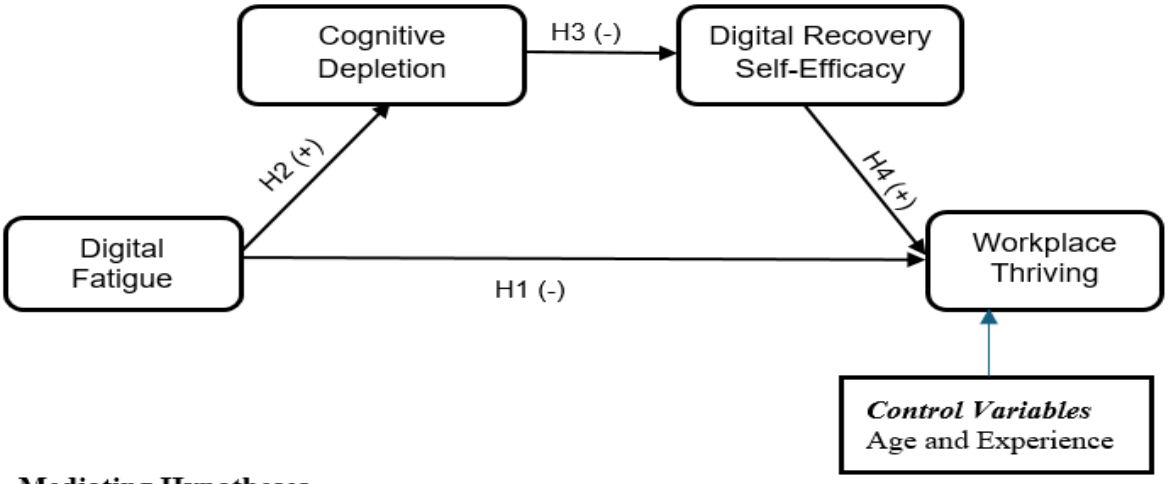
H4: Digital recovery self-efficacy has a positive effect on workplace thriving.

Cognitive Depletion and Digital Recovery Self-Efficacy as Sequential Mediators Between Digital Fatigue and Workplace Thriving

As it has already been mentioned, research has gradually emphasized that instead of depending on direct interactions alone, the effects of job demands on employee outcomes are often mediated by multiple interconnected psychological mechanisms (Morin et al., 2023; Tomas, 2021a). According to resource-based perspectives and the JD-R theory, scholars are mostly in agreement that high demands trigger a process of exhaustion, which progressively empties cognitive and psychological resources of workers, harming motivation and reducing overall performance (Bakker & Demerouti, 2024a). The empirical research reveals that the work of an individual demands cognitive resources at the start of the work, which conditions such conditions as cognitive depletion. These conditions then erode personal resources, such as self-efficacy and recovery-related beliefs (Bai et al., 2025; Hung et al., 2025; Tomas, 2021a). Such a chain of serial occurrence correlates with the research that revealed that reduced mental functioning undermines coping confidence, reduces the sense of control, and prevents adaptive action (Cavallari et al., 2025). Continuous connection and information overload have also been linked to mental exhaustion and trust in coping with the job requirements in the digital work environment (X. Zhang & Deng, 2025b). When taken as a whole, this material lends credence to the idea that digital fatigue is caused by a series of psychological processes that start with resource depletion and progress to the deterioration of personal resources that are necessary for maintaining vitality and learning at work.

Even while these sequential processes are becoming more well recognized, research has seldom looked at cognitive depletion and digital recovery self-efficacy as a unified mediation pathway that connects digital fatigue to workplace thriving. The previous studies pay little attention to the long-term outcomes or the individual mediators, thus limiting our possibilities to understand how digital fatigue will ultimately lead to a decline in thriving (Kleine et al., 2023; Porath et al., 2012a; Zhao et al., 2025b). Specifically, in digital work contexts, the joint function of cognitive depletion as an initial strain condition and digital recovery self-efficacy as a consequent personal resource has not been well explored (Bondanini et al., 2025b). This is a critical gap since sustained vitality and learning are pointers of prosperity, which cannot be undermined by one system (Zhao et al., 2025a). Existing models can understate the cumulative effect of digital fatigue on positive employee performance if they don't take this sequential process into consideration (Supriyadi et al., 2025) . To address this constraint, the current study suggests and evaluates a sequential mediation model in which cognitive depletion is exacerbated by digital fatigue, digital recovery self-efficacy is lowered by cognitive depletion, and reduced recovery self-efficacy ultimately jeopardizes workplace thriving. Through this, the research provides a better insight into the mechanism by which interdependent psychological processes impair success because of digital fatigue. We therefore suggest the following hypothesis:

H5: Cognitive depletion and digital recovery self-efficacy sequentially mediate the relationship between digital fatigue and workplace thriving.



Mediating Hypotheses

H5: Digital Fatigue → Cognitive Depletion → Digital Recovery Self-Efficacy → Workplace Thriving

Source(s): Author's Own Work

Figure 1: Conceptual Framework

Method

Sample and Procedure

The survey of this research comprises staff from four- and five-star hotels situated in major cities of Pakistan (Lahore, Karachi, Peshawar, Faisalabad, Multan, Islamabad, and Rawalpindi). The study hypotheses were tested using convenience sampling to recruit employees. Despite the limitations of the convenience sampling strategy in terms of generalizability, we chose to use this method for many reasons. Firstly, it is a very efficient and uncomplicated approach that minimizes time consumption and grants researchers the most convenient means of obtaining the required data (Stratton, 2021). Furthermore, previous studies in hospitality have often used a similar methodology (Masih, Kumar, et al., 2025). We adhered to the criteria established by Stratton (2021a) to improve the validity of the sampling approach and minimize biases related to it. We used simple and uncomplicated study objectives, a reliable

questionnaire, and research measures. Additionally, ensuring that the questionnaire is easy to comprehend, brief, and approachable for respondents was another strategy used to minimize non-response bias (Churchill & Iacobucci, 2006). Furthermore, the respondents were questioned in two different phases (T1 and T2). In the first phase, at T1, employees were asked to furnish responses reflecting their opinions on the predictor (digital fatigue), in addition to providing demographic information about themselves (such as gender, age, education, and experience). The same employees who participated in T1 were contacted again at T2, six weeks after the completion of T1, to obtain the responses on mediators (cognitive depletion and digital recovery self-efficacy) and the outcome variable (workplace thriving).

We used G*Power 3.1.9.7, with the range values defined by Cohen (1992), to calculate the sample size. By using a significance level (α) of .05, a statistical power of .80, an effect size of .15, and 01 predictors, it was determined that the optimal sample size for the current study is around 55. Ringle et al. (2015) propose that increasing the sample size by a factor of 3 would improve the framework's dependability. So, the proposed sample should be more than 231. In a previous study, Masih et al. (2025) used the same method to calculate the sample size. Before completing the questionnaire, permission was obtained from senior hotel executives to allow employee participation. The survey was conducted in English, which is regarded as the standard language within the corporate sector. Masih et al. (2024) used the English language to collect data from the tourism industry in the Pakistani business context. Out of the 450 survey forms that were handed out at Time 1, a total of 371 completed forms were collected. Out of these, 17 survey forms were deemed unusable due to incomplete information, leaving us with 354 legitimate responses. At Time 2, a total of 354 survey forms were redistributed to the staff members who had previously answered at Time 1. Of these, 266 survey forms were returned by employees. After excluding 21 responses that lacked necessary information and aligning the responses by using pre-assigned identification numbers and job IDs, our final sample size was 245. The overall participation rate achieved a percentage of 54%. Male employees constituted the bulk of respondents, accounting for 58%, whereas females accounted for 42%. In terms of age groups, 57.6% of employees were within the 18–25-year range, 20.8% were in the 26–30-year range, 13.9% were in the 31–35-year range, 3.3% were in the 36–40-year range, and 4.5% were 41 years of age or over. In terms of education, 36.7% of the employees surveyed had a 12-year education, 40.4% had a 14-year education, and 22.9% had a 16-year education. Lastly, of the employees who took the survey, 20.0% had between 1-5 years of experience, 7.3% had 6-10 years of experience, 15.9% had 11-15 years of experience, 31.8 had 16-20 years of experience, and 24.9% had experience of 21 years or above.

Measures

All constructs were measured using established, validated self-report scales utilizing a 5-point Likert scale format. Participants completed a five-item scale measuring digital fatigue, adapted from the Digital Stressors Scale (DSS) developed by Fischer et al. (2021). A sample item is “I feel mentally exhausted after spending long periods using digital devices.” Cognitive depletion was measured using the 5-item scale adapted from Vohs et al. (2005). A sample item is “I felt mentally drained and had difficulty exerting self-control.” A 5-item scale to measure the digital recovery self-efficacy was directly adapted from Tramontano et al. (2021). A sample item is “I am confident in my ability to manage my work time effectively, even when digital interruptions occur.” Workplace thriving was measured by a five-item scale adapted from Porath et al. (2012a). A sample item is “I feel alive and vital at work.”

Control Variables

Previous studies have revealed that factors such as gender, age, qualifications, and experience may all have an impact (Carmeli & Schaubroeck, 2007; Shin & Zhou, 2007). We controlled for age and experience, as these demographic variables have a significant effect on the dependent variable.

Data Analysis

We utilized SPSS 25 for the fundamental examination of demographic data, and SmartPLS version 4.1.0.0 (Ringle et al., 2022) for PLS-SEM (measurement and structural model). We utilized PLS-SEM because of its exceptional statistical strength in predicting associations between latent constructs. PLS may consider latent construction measurement errors and simultaneously evaluate the significance of the structural framework (Henseler et al., 2016). The measurement model was executed to confirm the validity and reliability of the research model, before the structural model was performed to test the hypotheses. The prediction precision of the study framework was assessed using the coefficient of determination (R^2), predictive significance (Q^2), and effect size (f^2) (Hair et al., 2012).

Results

Measurement Model

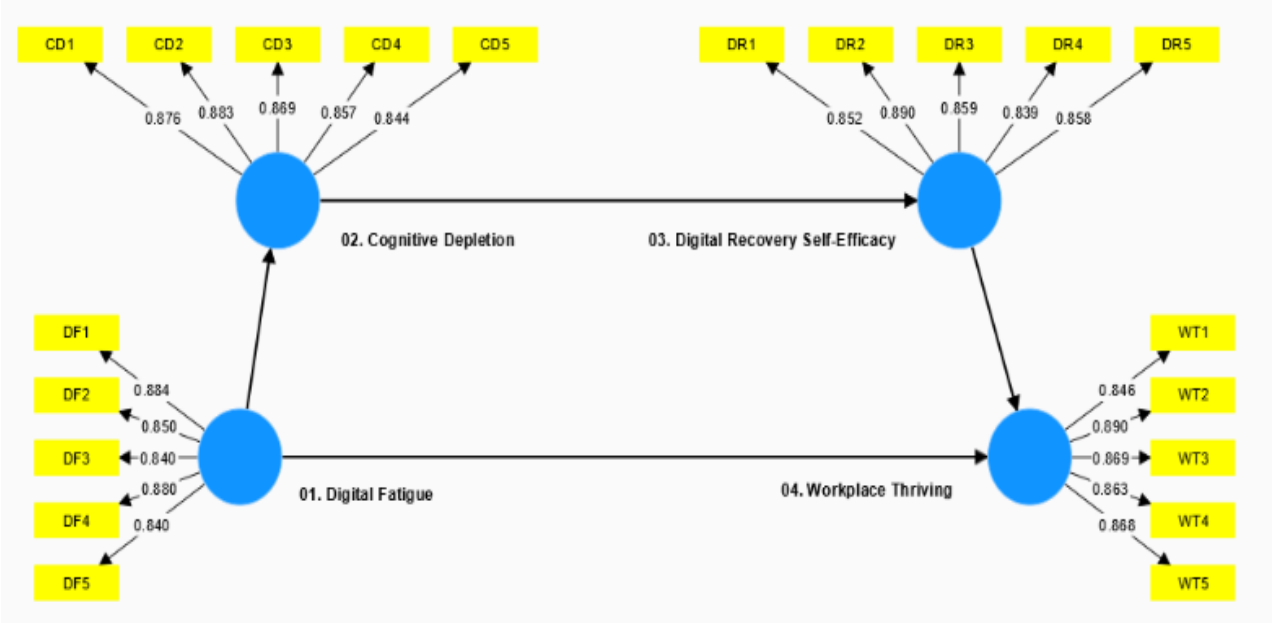


Figure 2: Measurement Model

The measurement model was evaluated using confirmatory factor analysis (CFA) in SmartPLS, as illustrated in Figure 2. The assessment focused on internal consistency reliability, convergent validity, and discriminant validity. The detailed results of the measurement model are presented in Tables 1 and 2. Internal consistency reliability was examined using Cronbach's alpha (CA) and composite reliability (CR). As reported in Table 1, all constructs demonstrated acceptable reliability, with CA and CR values exceeding the recommended threshold of 0.70. Specifically, Digital Fatigue (DF1–DF5), Cognitive Depletion (CD1–CD5), Digital Recovery Self-Efficacy (DR1–DR5), and Workplace Thriving (WT1–WT5) showed strong internal consistency. Convergent validity was assessed through indicator factor loadings and average variance extracted (AVE). The results indicate that all measurement items (DF1–DF5, CD1–CD5, DR1–DR5, and WT1–WT5) loaded significantly on their respective constructs, with factor loadings above 0.70. In addition, the AVE values for all constructs exceeded the minimum acceptable value of 0.50, confirming adequate convergent validity.

Discriminant validity was evaluated using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio. The square root of the AVE for each construct was greater than its correlations with other

constructs, satisfying the Fornell–Larcker criterion. Furthermore, all HTMT values were below the conservative threshold of 0.85, indicating satisfactory discriminant validity. Collinearity was also examined using inner variance inflation factor (VIF) values, all of which were below 3, suggesting that multicollinearity is not a concern in the model. Overall, the results confirm that the measurement model possesses adequate reliability, convergent validity, and discriminant validity, providing a sound basis for the subsequent assessment of the structural model.

Table 1. Factor Loading, Construct Reliability, and Validity

Items	Loadings	CA	CR	AVE
Digital Fatigue		0.911	0.934	0.738
DF1	0.884			
DF2	0.850			
DF3	0.840			
DF4	0.880			
DF5	0.840			
Cognitive Depletion		0.916	0.937	0.749
CD1	0.876			
CD2	0.883			
CD3	0.869			
CD4	0.857			
CD5	0.844			
Digital Recovery Self-Efficacy		0.912	0.934	0.739
DR1	0.852			
DR2	0.890			
DR3	0.859			
DR4	0.839			
DR5	0.858			
Workplace Thriving		0.918	0.938	0.753
WT1	0.846			
WT2	0.890			
WT3	0.869			
WT4	0.863			
WT5	0.868			

Note: CA: Cronbach's Alpha; CR: Composite Reliability; AVE: Average Variance Extracted

Table 2. Discriminant Validity and Variance Inflation Factor

	Fornell and Larcker				**HTMT**				**Inner VIF**			
	1	2	3	4	1	2	3	4	1	2	3	4
01. Digital Fatigue	0.859									1.000		1.177
02. Cognitive Depletion	0.721	0.866			0.785						1.000	
03. Digital Recovery Self-Efficacy	-0.388	-0.559	0.860		0.420	0.610						1.177
04. Workplace Thriving	-0.555	-0.729	0.765	0.867	0.603	0.794	0.836					

In addition, model fit was assessed to further validate the adequacy of the measurement model. The results of the model fit indices are reported in Table 3. The standardized root mean square residual (SRMR) values for both the saturated model (0.041) and the estimated model (0.057) were below the recommended

threshold of 0.08, indicating a good model fit. Furthermore, the values of d_ULS and d_G were within acceptable ranges, suggesting no significant discrepancy between the empirical covariance matrix and the model-implied covariance matrix. The normed fit index (NFI) values for the saturated model (0.927) and the estimated model (0.917) exceeded the minimum acceptable value of 0.90, confirming an adequate overall model fit. Collectively, these results demonstrate that the measurement model exhibits satisfactory goodness-of-fit and is appropriate for subsequent structural model analysis.

Table 3. Fit Summary

	Saturated model	Estimated model
SRMR	0.041	0.057
d_ULS	0.361	0.682
d_G	0.200	0.238
Chi-square	286.655	326.663
NFI	0.927	0.917

Structural Model

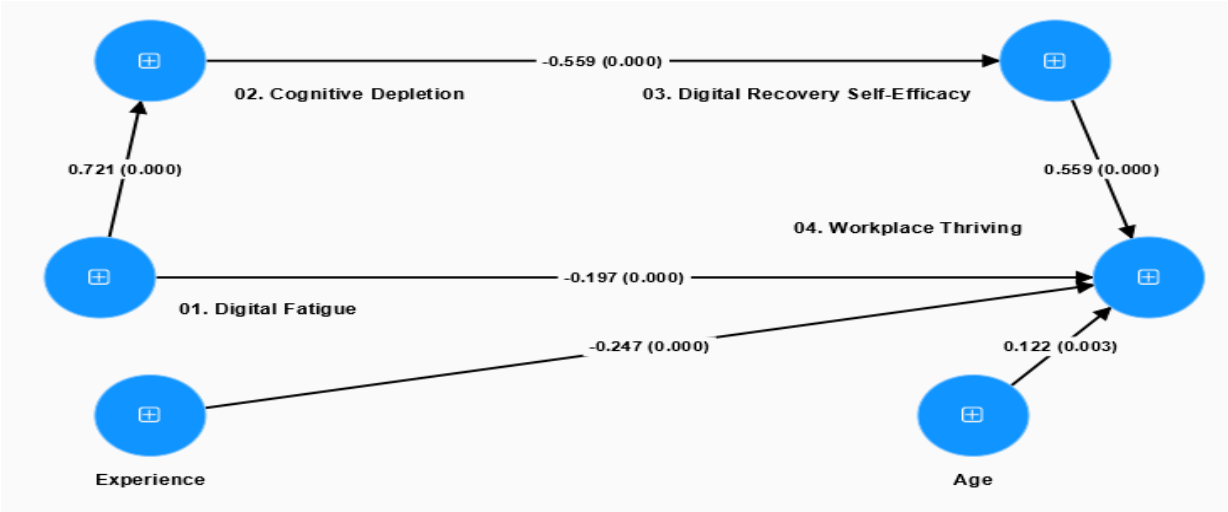


Figure 3: Structural Model

The structural model, also referred to as the inner model in PLS-SEM, was evaluated to test the hypothesized relationships among the constructs. The analysis was conducted using the bootstrapping procedure with 20,000 resamples to assess the significance of the path coefficients, as illustrated in Figure 3. The results of the direct and indirect relationships are presented in Table 4, while the coefficients of determination (R^2), predictive relevance (Q^2), and effect sizes (f^2) are reported in Table 5.

The results indicate that digital fatigue has a significant negative effect on workplace thriving ($\beta = -0.197$, $t = 4.072$, $p < 0.001$), supporting H1. Furthermore, digital fatigue positively influences cognitive depletion ($\beta = 0.721$, $t = 19.874$, $p < 0.001$), providing strong support for H2. In line with expectations, cognitive depletion negatively affects digital recovery self-efficacy ($\beta = -0.559$, $t = 10.613$, $p < 0.001$), thus supporting H3. The findings also reveal that digital recovery self-efficacy has a significant positive impact on workplace thriving ($\beta = 0.559$, $t = 9.633$, $p < 0.001$), confirming H4. Moreover, the indirect relationship analysis demonstrates that digital fatigue negatively affects workplace thriving through the sequential mediating roles of cognitive depletion and digital recovery self-efficacy ($\beta = -0.225$, $t = 6.727$, $p < 0.001$), thereby supporting H5.

Table 4. Direct and Indirect Relationships

Hypotheses	Path	Coefficient (β)	t-statistics	p-values	Decision
H1	Digital Fatigue -> Workplace Thriving	-0.197	4.072	0.000	Supported
H2	Digital Fatigue -> Cognitive Depletion	0.721	19.874	0.000	Supported
H3	Cognitive Depletion -> Digital Recovery Self-Efficacy	-0.559	10.613	0.000	Supported
H4	Digital Recovery Self-Efficacy -> Workplace Thriving	0.559	9.633	0.000	Supported
H5	Digital Fatigue -> Cognitive Depletion -> Digital Recovery Self-Efficacy -> Workplace Thriving	-0.225	6.727	0.000	Supported

Regarding explanatory power, the coefficient of determination (R^2) values indicate that the model explains 52.0% of the variance in cognitive depletion, 31.2% of the variance in digital recovery self-efficacy, and 66.4% of the variance in workplace thriving, suggesting substantial explanatory capability. The predictive relevance (Q^2) values for all endogenous constructs were greater than zero, confirming the model's predictive relevance. In addition, the effect size (f^2) analysis shows that digital fatigue has a strong effect on cognitive depletion ($f^2 = 1.083$), while its effect on workplace thriving is small ($f^2 = 0.235$). Cognitive depletion exhibits a moderate effect on digital recovery self-efficacy ($f^2 = 0.454$), and digital recovery self-efficacy demonstrates a strong effect on workplace thriving ($f^2 = 1.058$). Overall, these results confirm that the proposed structural model is statistically robust and provides strong empirical support for the hypothesized direct and indirect relationships.

Table 5. Coefficient of Determination, Predictive Relevance, and Effect Size

Endogenous Constructs	R^2	Q^2	f^2
Cognitive Depletion	0.520	0.516	
Digital Recovery Self-Efficacy	0.312	0.143	
Workplace Thriving	0.664	0.425	
Digital Fatigue -> Cognitive Depletion			1.083
Digital Fatigue -> Workplace Thriving			0.235
Cognitive Depletion -> Digital Recovery Self-Efficacy			0.454
Digital Recovery Self-Efficacy -> Workplace Thriving			1.058

Discussion

Major Findings

This research examines how digital fatigue has both direct and indirect effects on thriving in the workplace, but through a sequential mediating role of cognitive depletion and digital recovery self-efficacy. The major goal was to comprehend the psychological mechanisms by which digitally saturated work settings affect individuals' capacity to thrive at work. The research findings furnish substantial support for all proposed hypotheses. To begin with, the results indicate that digital fatigue has a significant impact on thriving in the workplace, which means that continuous digital overload negatively impacts the vibrancy and the growth of employees in the workplace. The result aligns with the prior research that states that superfluous digital demands could exhaust individual resources, decrease the psychological well-being, and growth-minded tendencies of employees (Supriyadi et al., 2025; Zhao et al., 2025a) . Workers in technologically charged environments are likely to have difficulties keeping their energy and enthusiasm up, and thus, they will not prosper. Second, the results show a positive relationship between digital fatigue and cognitive depletion, suggesting that employees' cognitive resources are depleted by extended contact with digital disruptions and

continuous interaction. The result aligns with the reasoning of the resource-based and self-regulation perspectives, which argue that mental fatigue is sped up by sustained attention demands (Bakker & Demerouti, 2024b; Bondanini et al., 2025a). Employees who are always under digital pressure could find it difficult to stay focused and exercise self-control, which could increase cognitive strain. Thirdly, the research study discovered that cognitive depletion negatively affected digital recovery self-efficacy, which suggested that exhausted cognitive resources negatively affected the capacity of employees to believe that they can engage in digital recovery and self-regulation (Tomas, 2021b). Individuals who suffer prolonged mental fatigue are less inclined to feel they are capable of handling digital limits, recuperating energy, or regaining control of their work operations (Chow et al., 2015b). Fourth, the results propose that digital recovery self-efficacy positively influences thriving in the workplace, and recovery-related attitudes are of relevance in enabling the workforce to be vital and able to learn despite digital demands (Porath et al., 2012b; Salanova et al., 2011b). Workers who feel safe in their skills to manage digital requirements can feel in a better position to decrease resources, adapt to forerunners, and take part in developmental ventures. Finally, the mediation analysis indicates that digital fatigue affects workplace thriving by sequentially mediating cognitive depletion and digital recovery self-efficacy. The study presents compelling proof of a psychological process through which digital fatigue diminishes beneficial work-related results, which can give a deeper insight into how digital stress contributes to a decline in thriving at work (S. Guo et al., 2025).

Theoretical Contributions

This paper brings considerable conceptual development. To begin with, it adds to the literature on thriving in workplaces because it identifies digital fatigue as an important antecedent that hones the vibrancy and learning of workers in digitally-intensive work-related settings. Whereas earlier studies have largely concentrated on leadership and job design as well as social elements, the current study puts emphasis on the role of digital stress in shaping workplace prosperity. Second, the research contributes to the body of cognitive depletion literature by experimentally demonstrating that the correlation between digital fatigue and recovery beliefs is mediated by digital fatigue. The article develops theoretical knowledge about digital demands and their impact on the limitation of self-regulatory resources and the limitation of adaptive performance to cognitive depletion as a fundamental psychological mechanism. Third, the mediator role of self-efficacy can be extended with the introduction of digital recovery self-efficacy since it could underscore the significance of perceived recovery skill in cyberspace. The findings indicate that the mechanism of recuperation is not an action process, but a thinking system of beliefs, which can define how the employees manage digital stress. Finally, this research combines the digital fatigue, cognitive depletion, and recovery self-efficacy by confirming a sequential mediation model as a single explanatory model. This works to create theories of digital well-being by offering a formalized understanding of the effects of digital stress on desirable workplace performance.

Practical Implications

There exist many practical implications of the findings of the study to firms operating within digitally intensive environments. Firstly, digital fatigue has drawn the attention of managers and organizations as one of the major threats to the workplace that compromises the capacity of employees in attaining success. Limiting unwanted digital interaction, mitigating the demands of twenty-four-hour interaction, and enhancing the realism of response time may assist in getting rid of digital strain. Second, companies must use tactics to minimize the depletion of the mind, such as promoting task fragments, removing digital distractions, and promoting focused working hours. Employees who get focus control and digital boundary-setting training may also benefit from cognitive resource preservation. Third, it is highlighted in the findings that there is a necessity to enhance digital recovery self-efficacy. The organizations can play their part by providing training on digital self-management, recovery techniques, and technological usage policies, which

will enable the employees to take control of their digital roles back. The executives should be typified by constructive online lifestyles and promote compensatory practices such as breaks, distance, and power renewals. Finally, through the creation of a favorable work environment that generates care in the employees, it may assist in sustaining the work environment. There is a possibility that through organizations, the effects of digital fatigue could be mitigated, as well as the encouragement of recovery-related competencies, thereby improving the long-term psychological well-being and performance of the employees.

Limitations and Future Recommendations

Regardless of its advantages, the given study has some disadvantages that are worth mentioning. To begin with, a cross-sectional method of collecting the data was used, and this removes the ability to draw causal conclusions. It is possible to conduct research later where longitudinal or experimental designs would be used to understand the dynamic impact of digital fatigue and recovery, over time. Second, the researchers used a self-report method, which raises doubts over the popular issue of method bias. Even though there were statistical solutions, it must be noted that future researches need data from many sources or objective measures of digital workload and recovery habits. Third, a special professional and cultural setting was used to select the sample that can minimize the generalizability of usability. In order to enhance external validity, the proposed model should be tested in different sectors, job roles, and cultures in the future. Lastly, in future studies, the research can build on this paradigm by incorporating additional moderators/mediators, like leadership support, online autonomy, or company recovery climate. The research on these factors could assist companies in better understanding how to prevent the adverse effects of digital fatigue and promote sustainable working conditions in the workplace.

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