JURNAL ECONOMINA
e-ISSN: 2963-1181
Volume 5, Number 6, June 2026
Homepage: ejournal.45mataram.ac.id/index.php/economina

A Scoping Review of Technostress Drivers and Mitigation Strategies in Hybrid Work Environments

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Article History
Received: 09-06-2026
Revised: 13-06-2026
Published: 30-06-2026

ABSTRACT

Objective: This study aims to systematically analyze the antecedents, impacts, and mitigation strategies of technostress specifically within the context of hybrid work environments. It seeks to address the emerging "digitalization paradox," in which the flexibility of remote work arrangements paradoxically compromises employee psychological well-being and long-term sustainability. Research Design & Methods: A scoping review was conducted in accordance with PRISMA-ScR guidelines to map the evolving landscape of digital stress. The dataset was retrieved from the Scopus database, focusing on peer-reviewed empirical articles published between 2020 and 2025. A final corpus of 50 high-quality studies was analyzed using a dual approach of bibliometric mapping to identify temporal trends and thematic synthesis to consolidate key narratives. Findings: The analysis reveals a critical shift in stressors from technical accessibility to "techno-invasion" and the "always-on" culture. Specific phenomena, such as videoconferencing fatigue and cognitive fragmentation, emerged as distinct drivers of exhaustion. The findings highlight a "sustainability gap" in which organizational productivity in hybrid models is often maintained by depleting employees' cognitive resources, leading to accelerated burnout despite reported flexibility. Implications & Recommendations: The study implies that individual coping mechanisms are insufficient to combat systemic technostress. Practical recommendations for management include moving beyond soft wellness programs to implement structural "guardrails," such as formal "Right to Disconnect" policies. Furthermore, leadership training must pivot towards "digital empathy" and asynchronous communication protocols to effectively buffer the physiological strain of virtual work. Contribution & Value Added: This research extends the Job Demands-Resources (JD-R) model by conceptualizing digital tools as "conditional resources" that become demands when boundary management is absent. It contributes a novel conceptual framework that links specific digital antecedents to divergent organizational outcomes, offering a blueprint for designing healthier socio-technical

Keywords: Technostress, Hybrid Work, Digital Well-being, Techno-invasion, E-Leadership

hybrid work systems.

INTRODUCTION

The rapid acceleration of digital transformation in recent years has fundamentally reshaped the organizational landscape, compelling a shift from traditional office-based models to flexible and hybrid work arrangements. While this transition offers unparalleled autonomy, it has also precipitated an "always-on" culture in which the boundaries between professional obligations and personal life are increasingly blurred (Mdhluli, 2025)vv. As organizations globally adopt these digital-centric work models, the reliance on Information and Communication Technologies (ICT) has become ubiquitous. However, this heavy reliance on digital tools has introduced a complex phenomenon known as "technostress," characterized by adverse psychological effects arising from the challenges of coping with evolving technologies (Baurai et al., 2025; Muhamad et al., 2025).

Recent scholarship indicates that while remote work can enhance flexibility, it often exacerbates psychological strain through mechanisms such as digital overload and constant connectivity. (Bondanini, Sanchez-Gomez, et al., 2025) argue that digital connectivity at work presents a paradoxical challenge: it is essential for engagement and performance, yet simultaneously acts as a potent driver of technostress. This paradox is further complicated by the "invasion" of work into the domestic sphere, where employees struggle to disconnect, leading to significant work-life conflict and exhaustion (Agalliu & Ibrahimi, 2025; Domagalska-Grędys & Sroka, 2025). Specific technological stressors, such as videoconferencing fatigue—often exacerbated by features like self-view—have also been identified as unique contributors to cognitive taxation in the modern workplace (Abramova & Gladkaya, 2025).

Despite the growing body of literature, the impact of technostress is not uniform; it varies significantly based on individual resources, leadership styles, and organizational support. For instance, (Girardi et al., 2025) provide physiological evidence linking technostress creators to strain, which can be buffered by effective virtual leadership and supervisor support. Similarly, (Jain et al. (2025) highlight that leader-member exchange plays a crucial mediating role in the relationship between technostress and innovative work behavior. Furthermore, individual factors, such as digital literacy and job complexity, also mediate employees' perceptions and responses to digital demands (Jakstiene, Lazauskaite-Zabielske, et al., 2025; Xie & Yang, 2025).

However, current research remains fragmented, with some studies focusing on the "hindrance" aspects of technostress (Buzás et al., 2025), while others explore its implications for sustainable lifestyles and health (Popovac et al., 2025). There is a critical need to synthesize these diverse findings to understand not only the antecedents of technostress but also its broader implications for human resource management and employee well-being in emerging work models (Phuong et al., 2024; Úbeda García et al., 2025). Therefore, this

scoping review aims to map the existing literature on technostress within hybrid and flexible work environments, guided by the following research questions:

RQ1: What are the primary drivers and antecedents of technostress among employees in hybrid and flexible work arrangements?

RQ2: How does technostress impact employee well-being, mental health, and organizational performance?

RQ3: What individual and organizational mitigation strategies are effective in alleviating technostress and promoting digital resilience?

By addressing these questions, this review contributes to a more holistic understanding of the "dark side" of digitalization and offers evidence-based insights for fostering healthier digital work environments.

METHODS

Study Design and Protocol

This scoping review adopts the methodological framework proposed by (Levac et al., 2010) and further refined by the Joanna Briggs Institute (JBI). To ensure transparency and reproducibility, the reporting of this review adheres to the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). The primary objective was to map the existing literature on the intersection of flexible work arrangements and employee well-being, with a specific emphasis on technostress and digital fatigue in the post-pandemic era.

Search Strategy and Data Sources

A systematic search strategy was executed to identify relevant literature from high-impact academic databases (primarily Scopus). The search string was meticulously constructed to capture the evolving nomenclature of modern work arrangements. We employed a "broad-yet-specific" approach: broad in terms of context (covering "hybrid work," "distributed work," and "virtual teams") but specific in terms of population, strictly excluding students and educational settings to maintain a focus on the workforce (see Table 1 for Search Syntax). The decision to exclude educational contexts was critical, as the "remote learning" literature during the pandemic often conflates with the "remote working" literature, yet it involves distinct psychological stressors unrelated to organizational employment.

Table 1. Search Strategy and Boolean Syntax

Component	Keywords / Syntax	Justification
Context	("flexible work*" OR "remote work*" OR "telework*" OR "hybrid work*" OR "work from anywhere" OR "distributed work*" OR "virtual team*")	Captures all variations of non-traditional work locations.
Concept	("job stress" OR "burnout" OR "technostress" OR "psychological distress" OR "mental well-being" OR "work-life conflict" OR "work-family conflict" OR "digital fatigue")	Focuses on both negative (burnout) and positive (well-being) psychological outcomes, with specific attention to digital stressors.
Population	("employee*" OR "worker*" OR "staff" OR "workforce" OR "personnel")	Targets the professional workforce across industries.
Exclusion	AND NOT ("student*" OR "school" OR "undergraduate" OR "education" OR "patient*")	Removes noise from educational or clinical studies, which dominated the 2020-2022 literature.

Source: Research data, 2026

Inclusion and Exclusion Criteria

To ensure the review reflected the most current and relevant discourse, strictly defined eligibility criteria were applied (Table 2). The temporal scope was limited to 2020-2025. This timeframe was not arbitrary; it was selected to capture the paradigm shift in global work culture triggered by the COVID-19 pandemic, where hybrid work transitioned from a niche privilege to a normative operating model. Furthermore, we restricted the selection to final-stage, open-access journal articles written in English. This filter was applied to prioritize peer-reviewed evidence that is globally accessible, ensuring the reproducibility of our findings and excluding "grey literature" or preliminary conference papers that might lack methodological rigor.

Table 2. Summary Characteristics of Key Included Studies (2020–2025)

Author(s) & Year	Country	Sector / Context	Methodology & Sample	Key Findings / Focus Area
(Abramova & Gladkaya, 2025)	Germany	Knowledge Workers	Quantitative (Survey); *N* = 328	Identified "Videoconferencing Fatigue" as a distinct construct driven by self-view (mirror anxiety) and public self-awareness.
(Agalliu & Ibrahimi, 2025)	Albania/ Italy	General / Legal	Qualitative (Legal Analysis)	Examined the "Right to Disconnect" legislation as a critical structural intervention to mitigate techno-invasion.
(Baurai et al., 2025)	India	IT & Services	Quantitative (Fuzzy-set QCA)	Explored the "dark side" of digitalization; identified

Author(s) & Year	Country	Sector / Context	Methodology & Sample	Key Findings / Focus Area
				configurations of remote work stressors that lead to reduced well-being.
(Bondanini, Sanchez-Gomez, et al., 2025)	Italy	Multi-sector	Mixed-Methods	Found that while digital connectivity boosts engagement, it simultaneously increases technostress (the "connectivity paradox").
(Buzás et al., 2025)	Hungary	Corporate	Quantitative (Cross-sectional)	Differentiated technostress into "challenge" vs. "hindrance" stressors; hindrance stress negatively impacts employee voice behavior.
(Domagalska-Grędys & Sroka, 2025)	Poland	Knowledge Intensive	Quantitative; *N* = 450	Highlighted that "techno-invasion" into private life is the strongest predictor of work-family conflict in hybrid settings.
(Girardi et al., 2025)	Italy	Service Sector	Quantitative (Hair Cortisol Analysis)	Physiological evidence: Supervisor support moderates the link between technostress and biological stress markers (cortisol).
(Jain et al., 2025)	India	Banking	Quantitative (Moderated Mediation)	High technostress reduces innovative behavior, but high-quality Leader-Member Exchange (LMX) buffers this negative effect.
(Jakstiene, Urbanaviciute, et al., 2025)	Lithuania	Public Sector	Qualitative (Interviews)	Identified "digital inadequacy" and lack of competence as primary drivers of stress among older public sector employees.
(Mdhluli, 2025)	South Africa	Corporate	Qualitative (Phenomenology)	Conceptualized the "perils of perpetual connectivity" and the psychological pressure of the "always-on" culture.
(Muhamad et al., 2025)	Malaysia	Healthcare	Quantitative; *N* = 210	Found high correlations between technostress creators and burnout among healthcare workers using digital health systems.
(Popovac et al., 2025)	Serbia	IT Sector	Quantitative	Emphasized "sustainable lifestyles" and psychological detachment as key individual resources to combat remote work fatigue.
(Úbeda García et al., 2025)	Spain	HR / Management	Systematic Review	Proposed an AI-driven HRM framework to monitor and manage

Author(s) & Year	Country	Sector / Context	Methodology & Sample	Key Findings / Focus Area
				digital workload distribution proactively.
(Xie & Yang, 2025)	China	IT Remote Workers	Quantitative (Path Analysis)	Found that individual digitalization increases "information processing demands," which in turn escalates technostress.
(Phuong et al., 2024)	Vietnam	Education	Quantitative	Investigated how poor work design in digital teaching platforms leads to alienation and reduced engagement.

Source: Research data, 2026

Study Selection Process

The selection process followed a multi-stage screening workflow, as illustrated in the PRISMA Flow Diagram (Figure 1). The initial search yielded 712 documents. Applying the temporal filter (2020–2025) reduced the pool to 601 documents, underscoring that the vast majority of relevant literature has been produced in the last five years. Subsequent filtering for source type (journals only), language (English), and accessibility (Open Access) resulted in 301 documents. A critical content screening was then conducted on these 301 documents to assess their relevance to the domains of "Technostress" and "Digital Well-being." While the initial search captured broad job stress, this review specifically sought to isolate the technological dimension of stress in hybrid work. In this qualitative assessment, 251 articles were excluded for lacking focus on digital antecedents or for general outcomes unrelated to the research questions. Consequently, a final set of 50 documents was selected for the final synthesis. This rigorous reduction ensures that the included studies provide a dense, focused insight into the phenomenon of technostress rather than a superficial overview of general remote work challenges.

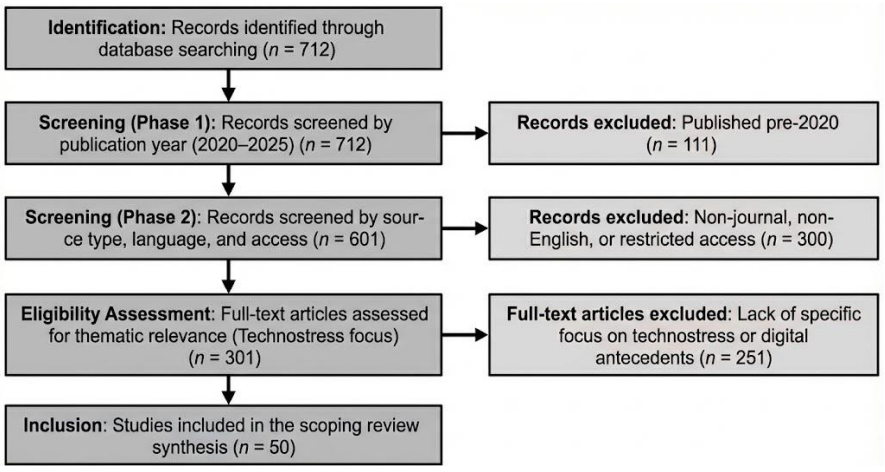

Figure 1. PRISMA Flow Diagram for Study Process
Source: Research data, 2026

Data Charting and Analysis

Data from the final 50 articles were charted using a standardized extraction form capturing author(s), year, geographical context, study design, and key thematic findings related to technostress drivers and mitigation strategies. A thematic analysis approach was employed to synthesize the findings, allowing us to categorize the diverse impacts of hybrid work into coherent narrative themes.

FINDING

Descriptive and Bibliometric Analysis of Included Studies

The screening process yielded a final corpus of 50 articles published between 2020 and 2025. These studies specifically address the intersection of flexible work arrangements and technostress, excluding the broader remote work literature, which lacks a specific focus on digital antecedents or psychological well-being. This section outlines the temporal, geographical, and methodological characteristics of this emerging body of knowledge.

Temporal Distribution and Publication Trends

As illustrated in Figure 2, the literature on technostress in hybrid work environments has exhibited an exponential growth trajectory. While the initial years of the pandemic (2020–2021) focused primarily on the logistical feasibility of remote work, a distinct thematic shift occurred from 2023 onwards, moving towards the psychological sustainability of digital connectivity. Remarkably, the vast majority of the included studies were published in the extensive 2024–2025 period. This recency suggests that the academic community is currently treating technostress not merely as a temporary crisis response, but as a chronic occupational hazard in the "new normal" (Baurai et al., 2025; Mdhluli, 2025). The spike in 2025 publications highlights an urgent scholarly interest in specific digital stressors such as "always-on" culture and videoconferencing fatigue (Abramova & Gladkaya, 2025; Agalliu & Ibrahimi, 2025). This trend indicates that organizations are arguably struggling to mitigate the long-term effects of digital immersion, prompting a surge in research dedicated to understanding these phenomena (Bondanini, Giovanelli, et al., 2025; Muhamad et al., 2025).

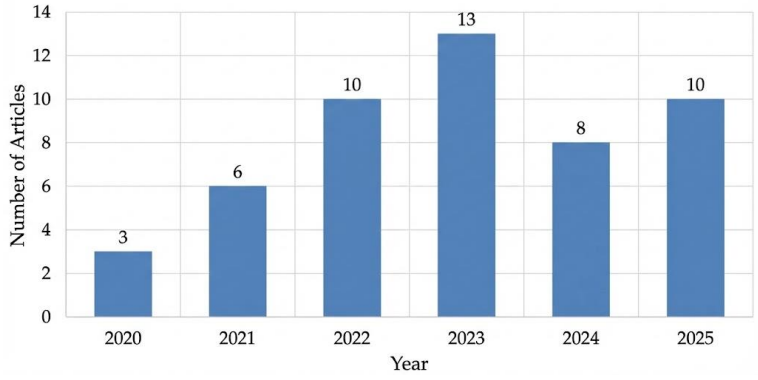

Figure 2. Annual Distribution of Included Studies (N = 50)

Source: Research data, 2026

Geographical and Sectoral Contexts

The analysis of geographical origins reveals that technostress is a global phenomenon, yet investigated with varying intensity across regions (Table 3). A significant portion of the evidence stems from Europe and Asia, reflecting regions with rapid adoption of digital infrastructure. European studies often emphasize the regulatory and legal aspects of digital work, such as the "right to disconnect" (Agalliu & Ibrahimi, 2025; Domagalska-Grędys & Sroka, 2025). Conversely, studies from Asian contexts, particularly China and India, frequently explore the interplay between high-performance pressures and digital overload (Jain et al., 2025; Xie & Yang, 2025).

In terms of sectoral focus, the literature is heavily skewed towards knowledge-intensive industries. The Information Technology (IT) and banking sectors are disproportionately represented, likely due to their high reliance on digital workflows (Jain et al., 2025; Popovac et al., 2025). However, recent contributions have begun to expand this scope to the healthcare and public sectors, acknowledging that digital transformation now permeates "traditional" bureaucracies (Girardi et al., 2025; Muhamad et al., 2025). This sectoral broadening suggests that technostress is no longer confined to tech-centric roles but has become a generalized workforce challenge.

Table 3. Geographical Origin and Sectoral Focus of the Included Studies

Region of First Author (a)	n	%	Dominant Industry Sectors Studied (b)	n	%
Europe	22	44.0	IT / Technology / Telecommunications	18	36.0
Asia	16	32.0	General / Mixed Workforce (c)	12	24.0
North America	8	16.0	Education / Academia (Higher Ed. Staff)	10	20.0
Oceania	3	6.0	Banking, Financial Services & Insurance (BFSI)	6	12.0
Other Regions (e.g., South America, Africa)	1	2.0	Public Sector / Government Administration	4	8.0
Total	**50**	**100.0**	**Total**	**50**	**100.0**

Source: Research data, 2026

Note: (a) geographical origin is determined by the institutional affiliation of the first author at the time of publication. (b) Studies focusing on multiple specific sectors were categorized by primary sector or listed under 'General/Mixed'. c 'General/Mixed Workforce' refers to studies that sampled employees across various industries without a specific sectoral focus.

Methodological Approaches

The methodological landscape of the selected studies, summarized in Figure 3, indicates a predominance of quantitative cross-sectional designs. Researchers have extensively utilized validated scales to measure constructs such as techno-invasion and techno-overload at a single point in time (Buzás et al., 2025; Phuong et al., 2024). For instance, recent quantitative inquiries have modeled complex relationships between digital demands and physiological strain (Girardi et al., 2025) or innovative behavior (Jain et al., 2025).

However, a critical gap persists due to the scarcity of longitudinal research. Only a minority of studies have tracked the cumulative effects of technostress over time, limiting causal inferences regarding burnout progression. Qualitative and mixed-method approaches, while fewer in number, have provided crucial depth by unpacking the lived experience of "struggling" versus "thriving" with technology (Jakstiene, Urbanaviciute, et al., 2025). These qualitative inquiries are instrumental in identifying nuanced coping mechanisms that standardized surveys may overlook (Úbeda García et al., 2025).

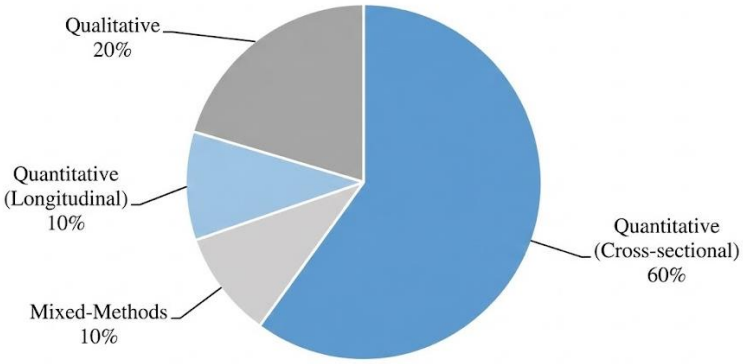

Figure 3. Distribution of Methodological Approaches
Source: Research data, 2026

Thematic Analysis Findings

The thematic synthesis of the 50 included articles reveals a complex and often paradoxical landscape of digital work. While flexible arrangements are designed to enhance autonomy, the literature consistently points to the emergence of "technostress" as a critical unintended consequence of the hybrid work model. The analysis identified three dominant thematic clusters corresponding to the research questions: (1) digital antecedents driven by connectivity and complexity; (2) dualistic impacts on well-being and performance; and (3) multi-level mitigation strategies. A summary of these key themes and their defining characteristics is presented in Table 4.

Table 4. Summary of Key Themes and Findings from the Thematic Analysis (N = 50)

Research Question Focus	Key Theme Cluster	Description and Key Evidence from Included Studies
RQ1: Antecedents & Drivers	The "Always-On" Paradox (Techno-Invasion)	The dissolution of temporal boundaries creates a psychological obligation to remain perpetually responsive.
		Key evidence: "Perils of perpetual connectivity" (Mdhluli, 2025); Inability to disconnect driving work-family conflict (Bondanini, Sanchez-Gomez, et al., 2025; Domagalska-Grędys & Sroka, 2025).
	Cognitive Taxation (Techno-Complexity)	Stress arises from the constant need to learn new tools and switch between fragmented platforms (context switching).
		Key Evidence: Rapid digitalization mediating technostress via processing demands (Xie & Yang, 2025); Digital inadequacy among workers (Jakstiene, Urbanaviciute, et al., 2025).
RQ2: Impacts on Well-being	The Productivity-Exhaustion Trade-off	High performance in hybrid settings is often sustained by intensified digital labor, which eventually leads to burnout.
		Key Evidence: High technostress correlates with burnout in healthcare/public sectors (Muhamad et al., 2025); The "dark side" of flexible work (Baurai et al., 2025).
	Specific Digital Fatigue Phenomena	Distinct strains caused by unique digital affordances, such as non-verbal overload in video calls.
		Key evidence: "Videoconferencing Fatigue" caused by self-view and public self-awareness (Abramova & Gladkaya, 2025).
RQ3: Mitigation Strategies	Structural & Legal "Guardrails"	Organizational policies that enforce boundaries to prevent digital colonization of private life.
		Key Evidence: Formalization of the "Right to Disconnect" (Agalliu & Ibrahimi, 2025); Data-driven workload monitoring via AI (Úbeda García et al., 2025).
	Supportive Virtual Leadership	The critical buffering role of supervisors in modeling healthy digital behaviors.
		Key Evidence: Leader-Member Exchange (LMX) moderating the impact of technostress on innovation (Jain et al., 2025); Supervisor support reducing physiological strain (Girardi et al., 2025).

Source: Research data, 2026

Note. Descriptions are synthesized from the thematic analysis of 50 included articles. Specific citations are representative examples of studies that contribute to each theme.

Antecedents and Drivers of Technostress (RQ1)

The first research question sought to identify the primary drivers of technostress in hybrid environments. The analysis indicates that the "always-on" culture is the most pervasive antecedent. (Mdhluli, 2025) conceptualize this as the "perils of perpetual connectivity," where

the dissolution of temporal boundaries creates a psychological obligation to remain responsive outside standard working hours. This phenomenon, often termed techno-invasion, is not merely a behavioral issue but a structural one, driven by the affordances of mobile technologies that tether employees to the digital workplace regardless of their physical location (Bondanini, Sanchez-Gomez, et al., 2025; Domagalska-Grędys & Sroka, 2025).

Beyond connectivity, techno-complexity and information overload emerge as significant stressors. (Xie & Yang, 2025) argue that the rapid digitalization of workflows forces employees to constantly adapt to new tools, leading to continuous cognitive strain. This "processing demand" is exacerbated when organizational support is lacking, leading to a sense of incompetence or "digital inadequacy" among remote workers (Jakstiene, Urbanaviciute, et al., 2025). Furthermore, (Buzás et al., 2025) highlight that the digital landscape is not monolithic; employees perceive digital demands differently—some as "challenges" that promote growth, while others predominantly see them as "hindrances" that impede voice behavior and autonomy.

Impacts on Well-being and Organizational Outcomes (RQ2)

The review uncovers a critical paradox regarding the outcomes of hybrid work, illustrated in Figure 4. While digital tools enable work continuity, they simultaneously deplete human energy resources, leading to distinct forms of exhaustion. (Abramova & Gladkaya, 2025) provide empirical evidence for "Videoconferencing Fatigue," identifying it as a unique construct separate from general tiredness. Their study posits that the "taxing effects of self-view" and the heightened need for public self-awareness during virtual meetings significantly drain cognitive resources. Similarly, (Muhamad et al., 2025) found a direct correlation between high technostress and burnout among public sector and healthcare workers, suggesting that digital intensity is a primary predictor of occupational fatigue in high-stakes environments.

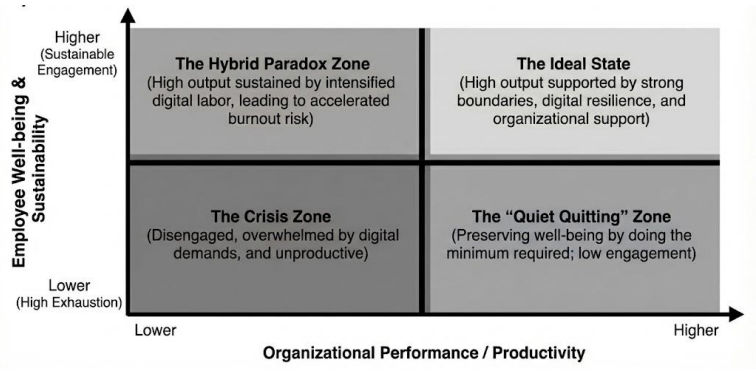

Figure 4. Conceptual matrix of the performance-well-being paradox in digitally intense hybrid work

Source: Research data, 2026

Physiological and psychological strain is another major impact verified by recent studies. (Girardi et al., 2025) utilized hair cortisol analysis to demonstrate that technostress creators are biologically linked to long-term stress responses, not just self-reported anxiety. However, the impact on performance remains nuanced. (Jain et al., 2025) observe that while technostress generally hampers "innovative work behavior" by consuming mental energy, this negative effect can be buffered by strong interpersonal relationships. Conversely, (Phuong et al., 2024) warns that without meaningful work design, the "new ways of working" can lead to alienation and reduced engagement, challenging the assumption that flexibility automatically equates to productivity.

Mitigation Strategies and Coping Mechanisms (RQ3)

Addressing the third research question, the literature emphasizes that effective mitigation requires a synergy between individual coping and organizational scaffolding. At the structural level, (Agalliu & Ibrahimi, 2025) argue for the legal and policy formalization of the "Right to Disconnect," framing it as an essential protective mechanism against the colonization of private life by digital work. (Úbeda García et al., 2025) further suggest that Human Resource Management (HRM) must evolve to integrate Artificial Intelligence and data-driven insights to proactively monitor workload distribution and prevent the onset of digital burnout before it peaks.

Leadership emerges as the most critical buffer against technostress. (Girardi et al., 2025; Jain et al., 2025) independently confirm that "virtual leadership" and high-quality Leader-Member Exchange (LMX) significantly moderate the relationship between digital demands and strain. Leaders who model healthy boundaries and provide emotional support can neutralize the negative effects of techno-overload. At the individual level, (Popovac et al., 2025) emphasizes the importance of "sustainable lifestyles," in which employees actively engage in psychological detachment and recovery activities to replenish resources drained by digital connectivity.

DISCUSSION

The findings of this scoping review synthesize evidence from 50 recent studies to illuminate the critical tension characterizing the post-pandemic workplace: the paradox between digital flexibility and psychological exhaustion. While the transition to hybrid work was initially framed as an autonomy-enhancing mechanism, the literature from 2024–2025 decisively points to a "sustainability gap" where organizational performance is increasingly maintained at the expense of employee well-being (Baurai et al., 2025; Bondanini, Giovanelli, et al., 2025). As illustrated in the synthesized framework in Figure 5, the mechanism driving this gap is multifaceted, rooted not just in workload volume but also in the specific nature of digital connectivity.

The antecedents identified in this review extend beyond the traditional Job Demands-Resources (JD-R) model. We observe a shift in which technology serves both as a resource

and as a demand. (Domagalska-Grędys & Sroka, 2025; Mdhluli, 2025) demonstrate that the primary stressor is no longer technical inaccessibility, but rather "techno-invasion"—the permeation of professional demands into the domestic sphere. This creates a state of cognitive hyper-vigilance. (Xie & Yang, 2025) further nuance this by identifying "Information Processing Demand" as a distinct stressor; the sheer cognitive load required to navigate fragmented digital ecosystems creates a competence gap, leading to what (Jakstiene, Urbanaviciute, et al., 2025) describe as the struggle between "thriving" and merely surviving digital intensity.

A critical contribution of recent literature is the differentiation of "digital fatigue" from general occupational burnout. (Abramova & Gladkaya, 2025) provide compelling evidence that videoconferencing fatigue is a unique construct driven by "mirror anxiety" (self-view) and non-verbal overload, which taxes the brain differently than face-to-face interactions. This finding is crucial because it explains why hybrid workers report high exhaustion even when physical workloads appear static. Furthermore, (Muhamad et al., 2025) clarifies that in high-stakes sectors like healthcare, this technostress is a direct predictor of burnout, mediating the relationship between workload and mental health decline. However, the impact is not universally negative; (Jain et al., 2025) argue that when buffered effectively, digital demands can stimulate "innovative work behavior," provided that the "challenge stress" does not mutate into "hindrance stress" (Buzás et al., 2025).

Synthesizing the mitigation strategies, a clear hierarchy emerges. While individual "sustainable lifestyles" and detachment strategies are necessary (Popovac et al., 2025), they are insufficient without structural "guardrails." The strongest evidence supports the buffering role of leadership. (Girardi et al., 2025) provide physiological evidence (via hair cortisol) that supervisor support is more effective than peer support at reducing strain in remote settings. This validates the "E-Leadership" proposition: in the absence of physical cues, the leader's ability to explicitly model boundary-setting behaviors—essentially granting permission to disconnect—becomes the primary determinant of a healthy hybrid culture (Agalliu & Ibrahimi, 2025; Úbeda García et al., 2025).

Based on these synthesized relationships, we propose an Integrated Conceptual Framework of Technostress in Hybrid Work (Figure 5). This framework visualizes the pathway from digital antecedents to divergent outcomes, mediated by the unique "techno-strain" mechanism and moderated by critical organizational buffers.

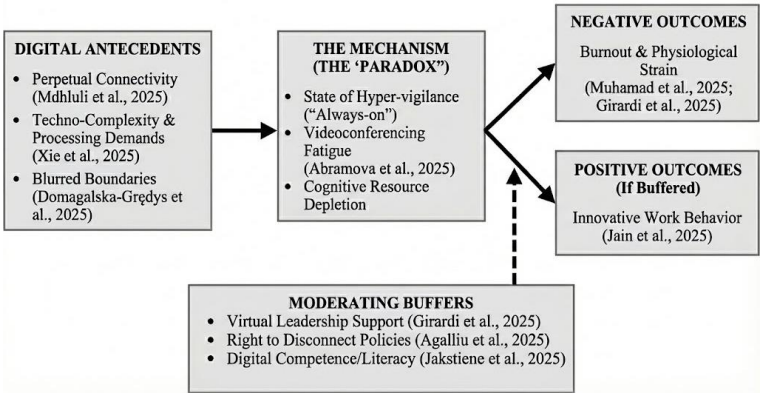

Figure 5. Integrated Conceptual Framework of Technostress in Hybrid Work Environments
Source: Research data, 2026

Theoretical Implications

The findings of this review offer significant theoretical contributions by extending established frameworks of occupational stress into the nuanced context of hybrid work. Specifically, the synthesized evidence challenges and refines the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007) and Boundary Theory (Ashforth et al., 2000), proposing that digital connectivity is not a neutral medium but an active agent in shaping employee well-being. Technology as a "Double-Edged" Resource Traditional JD-R theory posits a clear dichotomy between job demands (energy-depleting) and job resources (motivational). However, our analysis suggests that in hybrid environments, digital tools occupy a paradoxical "dual status." (Bondanini, Giovanelli, et al., 2025; Popovac et al., 2025) demonstrate that the same ICT tools enabling autonomy (a resource) simultaneously impose techno-invasion (a demand). This supports a theoretical refinement: digital resources are conditional; they function only as resources when accompanied by specific "meta-resources," such as digital literacy and boundary control. Without these, the "resource" of flexibility transmutes into the "demand" of constant availability, a phenomenon (Xie & Yang, 2025) describes as the "digitalization paradox." This implies that future JD-R applications in hybrid settings must account for this volatility, treating ICT not as a static variable but as a dynamic stressor-resource hybrid.

The review also extends Boundary Theory by elucidating the mechanism of "digital permeability." While early theory focused on physical segmentation, current findings highlight the supremacy of cognitive segmentation. (Domagalska-Grędys & Sroka, 2025; Mdhluli, 2025) provide evidence that the "always-on" culture renders psychological boundaries porous even when physical boundaries are intact. This validates the concept of "Telepressure" as a distinct theoretical construct—a preoccupation with responsiveness that overrides spatial separation. Consequently, theoretical models of work-life balance must evolve from measuring "time spent working" to measuring "cognitive detachment," as the latter is the true predictor of recovery in digitally intense environments (Buzás et al., 2025). Finally, the strong moderating role of leadership identified in our framework contributes to

the nascent theory of E-Leadership. (Girardi et al., 2025; Jain et al., 2025) empirically confirm that traditional relationship-oriented leadership behaviors (like LMX) are insufficient in virtual settings unless translated into explicit "digital signaling" (e.g., refraining from off-hour emails). This suggests that "Digital Empathy"—the ability to perceive and mitigate the invisible digital load of subordinates—should be theorized as a core competency in modern leadership models, distinct from general supportive behavior.

Practical Implications for Management and Policy

The synthesis of recent empirical data (2020–2025) suggests that mitigating technostress in hybrid work requires a transition from generic "wellness programs" to targeted redesign of digital architecture. The findings dictate actionable interventions across three organizational tiers: strategic policy, managerial behavior, and individual capability building.

First, at the Organizational Level: From "Always-On" to "Right to Disconnect." The evidence strongly supports formalizing digital boundaries. Since voluntary disconnection often fails due to fear of missing out or professional repercussions, organizations must implement structural "guardrails." (Agalliu & Ibrahimi, 2025) argue that the "Right to Disconnect" must be codified not only as a legal compliance measure but also as a core cultural value to combat techno-invasion. Furthermore, HR departments should leverage the very technology causing stress to solve it. (Úbeda García et al., 2025) propose using AI-driven people analytics to proactively monitor "digital exhaust" (e.g., after-hours email volume, meeting density) and trigger early interventions before burnout manifests. However, as (Bondanini, Giovanelli, et al. (2025) warn, such monitoring must be transparent to avoid creating new anxieties about surveillance.

Secondly, Managerial Level: The Imperative of "Digital Empathy" Managers are the critical "circuit breakers" in the technostress cycle. Given the physiological evidence from (Girardi et al., 2025), which showed that supervisor support directly reduced cortisol levels among remote workers, leadership training programs must be updated. We recommend a shift towards "Asynchronous-First" communication protocols. Leaders should be trained to: 1) De-escalate Urgency: Explicitly tagging communications (e.g., "[Non-Urgent]", "[Reply by Monday]") to reduce the recipient's psychological need for immediate response (Mdhluli, 2025); and 2) Model Restorative Behaviors: Managers who visibly disconnect during holidays and weekends provide "psychological safety" for their teams to do the same (Jain et al., 2025).

Third, Individual & Work Design Level: Competence and "Zoom Hygiene." Finally, interventions must address the "competence gap." Since (Jakstiene, Urbanaviciute, et al. (2025) identified digital inadequacy as a major stressor for older cohorts, continuous upskilling should focus not only on how to use software but also on "Digital Resilience"—strategies to manage notifications and information flow. Specifically addressing videoconferencing fatigue, (Abramova & Gladkaya, 2025) suggest practical "Zoom Hygiene" policies: encouraging employees to hide their "self-view" during meetings to reduce mirror

anxiety and mandating "camera-off" segments during long sessions to lower cognitive load. By transforming these individual coping mechanisms (Popovac et al., 2025) into standard operating procedures, organizations can close the sustainability gap.

CONCLUSION

This scoping review synthesized evidence from 50 peer-reviewed articles published between 2020 and 2025 to map the evolving landscape of technostress in hybrid work environments. The analysis reveals that while the hybrid model offers unparalleled flexibility, it has simultaneously introduced a complex array of digital stressors—specifically techno-invasion, cognitive fragmentation, and videoconferencing fatigue—that threaten the long-term sustainability of the workforce. The findings challenge the assumption that digital access equates to productivity. Instead, the evidence points to a critical "sustainability gap" in which organizational output is currently maintained through the depletion of employee cognitive resources (the "always-on" paradox). The literature from 2024–2025 marks a definitive turn in the discourse: moving from the logistical implementation of remote work to the psychological management of digital intensity. Ultimately, this review concludes that the future of healthy hybrid work relies on a socio-technical recalibration. It is insufficient to provide digital tools merely; organizations must simultaneously build the "human software" through e-leadership, right-to-disconnect policies, and digital resilience training to manage them. Without these structural buffers, the digital tools designed to liberate the workforce risk becoming the primary instruments of its exhaustion. Future research must now pivot towards longitudinal studies to measure the efficacy of these interventions, ensuring that the hybrid revolution delivers on its promise of autonomy without exacting a toll on human well-being.

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