



## Mapping and synthesizing the landscape of artificial intelligence and technostress: A hybrid bibliometric and systematic review approach

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### Abstract

The objective of this study is to map and synthesize scholarly research on the relationship between artificial intelligence and technostress. To achieve this objective, a hybrid review approach was adopted, combining bibliometric analysis with a systematic literature review (SLR). As AI adoption has accelerated globally, new forms of psychological strain have emerged that extend beyond traditional information and communication technology (ICT) frameworks. Following a PRISMA-guided screening process, 34 empirical studies published between 2020 and 2025 were selected for systematic synthesis. Bibliometric mapping revealed a marked increase in research output since 2023, with substantial contributions originating from China, India, Germany, and Spain. Thematic analysis of the selected studies showed that AI-induced technostress most commonly arose from cognitive overload, algorithmic complexity, and perceived loss of control. These mechanisms both align with and extend classical technostress creators identified in earlier ICT research. The findings further indicated that psychological outcomes such as burnout, anxiety, and reduced well-being frequently accompanied AI integration in work settings. At the same time, individual and organizational resources, including coping strategies, digital literacy, and organizational support, were consistently identified as mitigating factors. Based on the integrated evidence, this review proposes a conceptual model that synthesizes the Technostress Model, the Job Demands-Resources (JD-R) framework, technology acceptance theories, and Task-Technology Fit (TTF). This model clarifies the dual role of AI as both a demand-enhancing and resource-enhancing element within contemporary work systems. The review also highlights the need for longitudinal and cross-cultural research to advance understanding of AI-induced technostress over time and across contexts.

**Keywords:** *Artificial Intelligence; Bibliometrics; Systematic Review; Technostress*

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## **Introduction**

The accelerated adoption of artificial intelligence (AI) across various sectors has transformed the nature of work, communication, and decision-making processes. In 2023, global investments in intelligent technologies surpassed \$154 billion (IDC, 2024), and Indonesia's internet penetration rate reached 77% (APJII, 2023). These statistics indicate a profound digital transformation, with AI-driven systems becoming increasingly embedded in daily and organizational practices. While the advent of AI has been shown to enhance efficiency and augment decision-making processes, its increasing pervasiveness across various facets of society has also given rise to complex psychological implications, most notably technostress.

Technostress, originally introduced by Brod (1984) and later elaborated by Tarafdar et al. (2007), refers to a form of psychological strain arising from individuals' difficulties in adapting to technological demands. Within organizational research, technostress has traditionally been conceptualized through five core dimensions: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. These dimensions were developed primarily in the context of conventional information systems, where technology functioned as a supportive or administrative tool rather than an autonomous decision-making agent.

Emerging evidence, however, suggests that AI-driven work environments introduce qualitatively different stressors that are not fully captured by these classical categories. Empirical studies increasingly report intensified cognitive demands, heightened uncertainty stemming from algorithmic opacity, concerns over automation-related job displacement, and emotional discomfort associated with delegating judgment to autonomous systems. Taken together, these developments indicate that technostress in the AI era extends beyond traditional ICT-related strain and calls for renewed conceptual clarity.

A growing body of empirical research has documented the consequences of technostress for job satisfaction, work performance, and psychological well-being (Spagnoli et al., 2020). Prior studies further indicate that individual psychological resources, including coping strategies, resilience, and self-efficacy, can mitigate these adverse effects (Califf et al., 2020). Despite this expanding evidence base, the literature remains fragmented in several important respects. First, AI is frequently conceptualized in a dichotomous manner, either as a source of strain or as a productivity-enhancing tool, with limited effort to integrate its dual role within a coherent theoretical framework. Second, the predominance of cross-sectional survey designs constrains understanding of how AI-induced technostress evolves over time or across stages of technological adoption. Third, existing empirical work has been geographically concentrated, particularly in Europe and East Asia, resulting in the underrepresentation of emerging economies where differences in digital infrastructure and cultural context may shape technostress in distinct ways.

These gaps highlight the need for a comprehensive and updated synthesis of empirical evidence on AI-induced technostress, particularly given the substantial increase in publications in recent years. The number of studies on AI and technostress has risen sharply since 2019, with the most notable surge occurring between 2023 and 2024. This escalation reflects a global recognition of AI's psychological impacts across sectors including education, healthcare, software industries, and government. Yet, despite this rapid expansion, conceptual integration across studies remains limited, and, to the best of our knowledge, no prior review has systematically combined bibliometric mapping with a systematic literature review (SLR) to provide both macro-level insights and micro-level thematic synthesis.

To address these shortcomings, the present study employs a hybrid approach integrating bibliometric analysis with a systematic literature review guided by PRISMA 2020 (Page et al., 2021). The bibliometric component maps the scientific structure, intellectual networks, and conceptual evolution of AI technostress research, while the SLR component synthesizes empirical findings from 34 eligible studies published between 2020 and 2025. The integration of these two

methodologies enables the study to achieve three objectives: (1) identify global publication trends and dominant research clusters, (2) synthesize conceptualizations of AI-induced technostress, and (3) propose an integrated conceptual model that positioning coping strategies as a central psychological mechanism in navigating AI-driven work environments.

This hybrid review contributes to the existing discourse in several ways. Theoretically, it elucidates the distinct mechanisms through which AI generates technostress beyond conventional ICT frameworks by integrating multiple theoretical perspectives on psychological strain in AI-mediated contexts. Methodologically, it represents the first combined bibliometric and systematic review of the field during a critical period of accelerated AI deployment. Practically, it offers actionable insights for policymakers, organizations, and practitioners seeking to design psychologically sustainable AI adoption strategies. Collectively, these contributions advance understanding of AI's psychological implications and support the development of healthier and more sustainable human–AI interactions.

## **Method**

This study adopted a hybrid methodological approach that combined bibliometric analysis with a systematic literature review (SLR) to examine the research landscape on AI-induced technostress. This design was selected to capture both the structural development of the field and the substantive insights derived from empirical findings. Bibliometric analysis facilitated the mapping of research trends and intellectual structures, while the SLR enabled a rigorous and conceptually grounded synthesis of empirical evidence in accordance with established review standards (Donthu et al., 2021).

The literature search was conducted in June 2025 using five major academic databases: Scopus, SpringerLink, Sage, ScienceDirect, and ProQuest. These sources were chosen for their extensive coverage of peer-reviewed research in psychology, information systems, and technology-related disciplines. To maintain methodological consistency and support replicability, the same search string was applied across all databases.

("artificial intelligence" OR "AI") AND ("technostress" OR "digital stress" OR "ICT-related stress").

The search was limited to empirical journal articles published in English between January 2020 and June 2025, a period that coincided with the rapid global diffusion of AI technologies, including automation, algorithmic systems, and generative AI. Studies were included if they (a) reported empirical findings, (b) explicitly examined AI and technostress as central constructs, and (c) provided accessible full-text articles. Publications were excluded if they consisted of review papers, conference proceedings, or conceptual essays without empirical data, as well as studies addressing general ICT-related stress without a specific focus on AI-based systems. Articles discussing automation or digital transformation in the absence of AI applications were also excluded.

The screening process followed the PRISMA 2020 guidelines (Page et al., 2021) and proceeded through four sequential stages: identification, screening, eligibility, and inclusion. The initial database search yielded 485 records. During the identification stage, 34 duplicate entries were removed, resulting in 451 unique articles. Title screening was then conducted to assess relevance, leading to the exclusion of 409 records that addressed topics outside the scope of this review, such as cloud computing, general digitalization, cybersecurity, robotics, or ICT-related stress without an explicit focus on AI. This step resulted in 76 articles advancing to the abstract screening stage.

Abstract screening further excluded studies that did not examine psychological outcomes, failed to operationalize technostress, or addressed AI only in a peripheral manner. This stage resulted in 46 articles advancing to full-text eligibility assessment. During full-text review, 30 articles were excluded because the full texts were inaccessible, and one article was removed because it was not written in English. An additional 11 studies were excluded due to the absence of clearly defined technostress constructs or because AI was not the primary focus of analysis. Following this process, 34 articles were retained for the final synthesis.

A PRISMA flow diagram summarizing each stage of the screening and selection process was presented in the Results section. To ensure methodological rigor, all eligible studies underwent a structured quality appraisal using the Critical Appraisal Skills Programme checklist (CASP, 2018; 2020). The CASP framework was selected for its suitability in evaluating diverse empirical designs commonly used in behavioral and organizational research. Each study was assessed against key criteria, including clarity of research aims, appropriateness of study design, sampling strategies, validity of data collection methods, transparency of analysis, and coherence between results and conclusions.

The quality appraisal was conducted independently by two reviewers. Any disagreements were discussed and resolved through consensus, which strengthened the reliability of the evaluation process. Only studies classified as acceptable or high quality were retained for further analysis.

Bibliometric mapping was then carried out using VOSviewer (Van Eck & Waltman, 2017), a software package commonly employed to visualize scientific networks and conceptual relationships. Three types of networks were generated: co-authorship, co-citation, and keyword co-occurrence. In the present study, the keyword co-occurrence network was reported, as it offered the most direct and interpretable representation of thematic connections between artificial intelligence and technostress.

A qualitative synthesis of the 34 included studies was conducted using thematic analysis, guided by the procedural steps outlined by Braun and Clarke and commonly applied in systematic literature reviews. To achieve familiarity with the data, all articles were read multiple times. This process was followed by systematic coding of content related to AI-induced technostress mechanisms, psychological responses, organizational conditions, and coping processes.

The initial codes were subsequently grouped into broader thematic categories, which were reviewed for internal coherence and refined into final themes. The analysis was performed manually by two reviewers to preserve interpretative depth and theoretical sensitivity. Any discrepancies in coding decisions or theme development were addressed through iterative discussion until full consensus was reached.

Together, the integration of bibliometric mapping, PRISMA-guided screening, CASP-based quality appraisal, and thematic synthesis supported a level of analytical rigor, transparency, and replicability consistent with expectations for high-impact international journals.

## **Result and Discussion**

This study adopts a combined bibliometric and systematic review approach. Bibliometric analysis maps publication trends, influential countries, and keyword structures, while the systematic review synthesizes theoretical frameworks, empirical findings, and research gaps related to AI-induced technostress.

### **a. Result**

To provide an initial overview of the development of research on artificial intelligence and technostress, a bibliometric analysis was first conducted to examine publication trends over time. Mapping the annual volume of publications was a foundational step in understanding how scholarly attention to this topic has evolved alongside broader advances in AI technologies. This

temporal perspective offered important contextual grounding for interpreting subsequent thematic and conceptual findings.

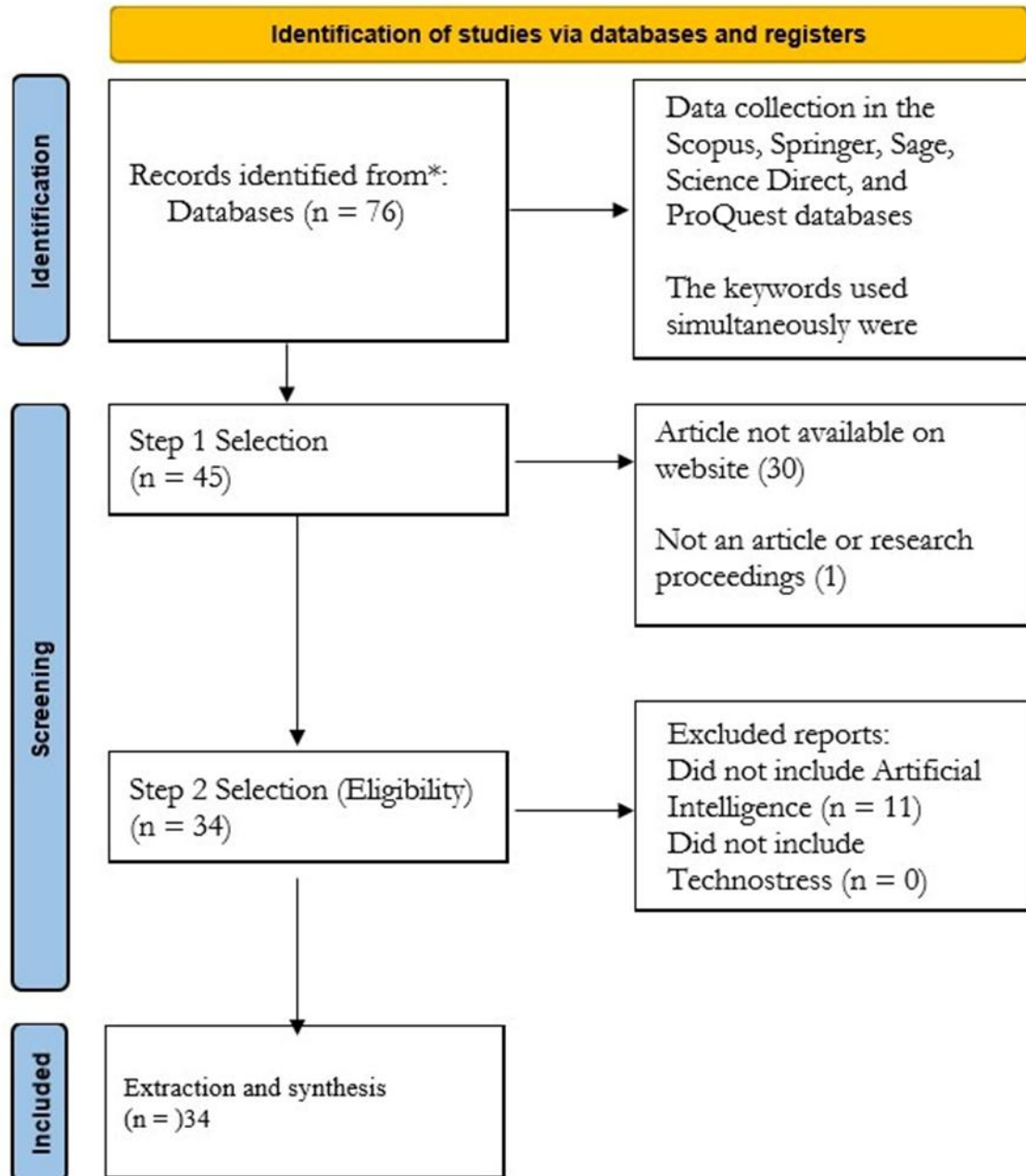


Figure 1. PRISMA Flow Diagram

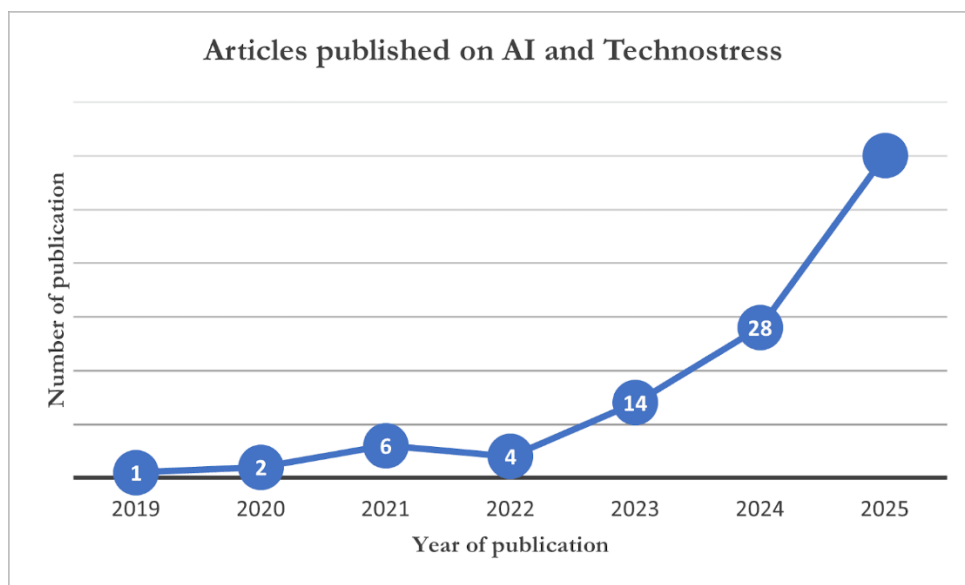


Figure 2. Number of articles published on AI and Technostress

Figure 2 illustrates the temporal distribution of publications addressing artificial intelligence (AI) and technostress between 2019 and 2025. The earliest identified publication appeared in 2019, followed by a gradual increase to two publications in 2020 and six publications in 2021. A slight decline was observed in 2022, with four articles published during that year. Subsequently, a pronounced upward trend emerged in 2023, when the number of publications increased to fourteen, and continued to rise sharply in 2024, reaching twenty-eight articles. Preliminary data for 2025 indicate a continued upward trajectory, reflecting sustained scholarly engagement with AI-induced technostress.



Figure 3. The Number of Research on Artificial Intelligence and Technostress

Figure 3 shows the distribution of global research on Artificial Intelligence and Technostress. As illustrated in Figure 3, the highest number of publications is in China, with 14. Following closely behind are India, South Africa, and Spain, each with 7 publications, constituting 7% of the total.

Germany (6%) and the United States (4%) are also significant contributors to this research landscape.

Figure 3 also illustrates that there are still many countries with white areas, representing that these countries are not detected in research publications discussing AI and Technostress. These countries include Australia, the majority of Middle Eastern countries, and several regions in South America, Africa, and Eastern Europe. This finding suggests that publications concerning AI and Technostress are predominantly concentrated in specific countries, notably in Asia and Europe, while many other regions have contributed comparatively less to the development and publication of literature in this field.

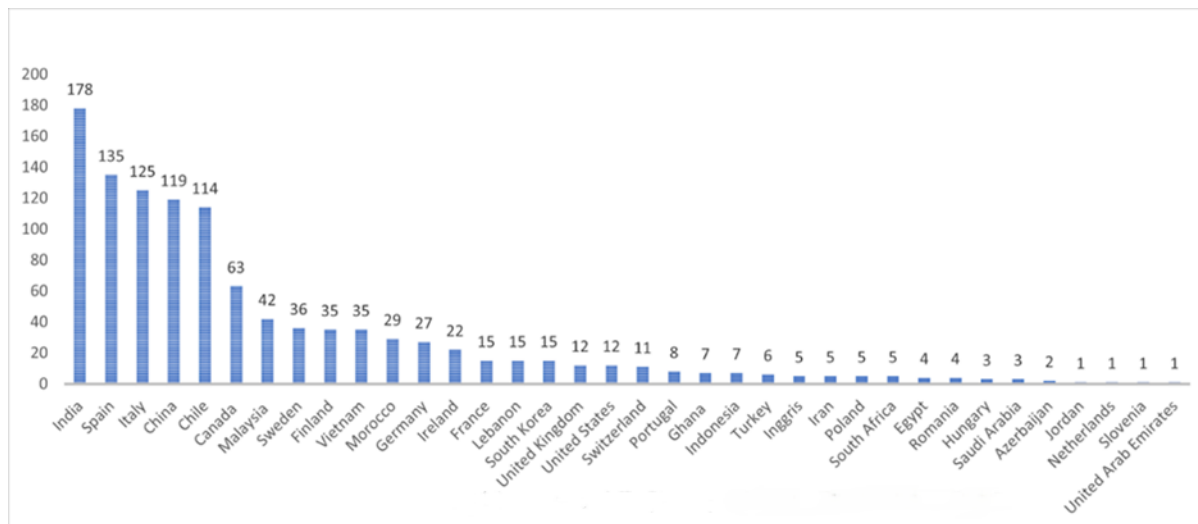


Figure 4. Number of Citation Per Country

The number of citations in Figure 4 shows which scientific articles serve as reference sources for researchers discussing AI and technostress. Scientific articles published in Indian journals on AI and technostress have received significant attention from researchers in various countries. The number of citations for scientific articles on AI and technostress published in India reached 178, ranking first compared to other countries. The top three countries with the most citations, respectively, are Spain and Italy. Spain recorded 135 citations, while Italy had 125 citations. China and Chile also had citations similar to those of Spain and Italy. China had 119 citations, and Chile had 114 citations. Only these five countries had citations for articles on AI and technostress exceeding 100. Additionally, certain countries have demonstrated their involvement in citations for scientific articles on AI and technostress, including Canada, which had 63 citations, Malaysia, which had 42 citations, Sweden, Finland, and Vietnam had 35 citations. Twenty-six other countries also received attention from researchers; however, the number of citations for these countries did not reach 100, and in some cases, it was less than 30.

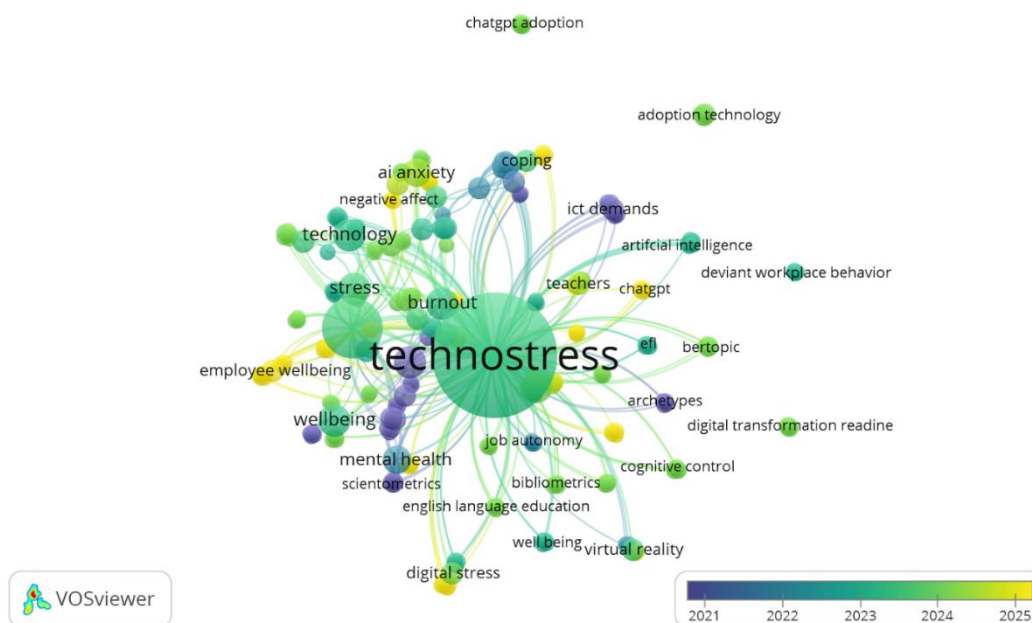


Figure 6. Mapping of Artificial Intelligence and Technostress Research

As illustrated in Figure 6, the factors most closely related to technostress are represented by specific colors, each of which is assigned a distinct meaning. The color yellow denotes the most recent research topics, including "employee wellbeing," "AI anxiety," "negative affect," "ChatGPT," and "digital stress." These topics are indicative of more current and contemporary themes in research. This visualization also underscores the emerging direction of mental health issues in research in 2024, as evidenced by keywords such as "burnout," "stress," "digital stress," and "wellbeing," which are gradually becoming a priority of research. As indicated by Figure 6, "burnout" is the concept most closely related to technostress. This finding suggests that researchers are increasingly perceiving burnout as one of the most prominent psychological consequences of technology-related stress. The concept of "technostress" emerges as the central node, surrounded by a substantial network of interconnected keywords including "burnout," "stress," "mental health," "wellbeing," "employee wellbeing," and "digital stress." A review of the most recent literature reveals a notable prevalence of keywords on digitalization, including "technology," "digital transformation readiness", "adoption technology", "ChatGPT," "ITC demand," and "ChatGPT adoption."

Table 1. Literature Review Table

Authors & Year	Title	Key Finding	Conclusion	Country
Kim, Park, Kim, Kim, & Seo, 2022	Technostress causes cognitive overload in high-stress people: Eye tracking analysis in a virtual kiosk test	High-stress participants experienced cognitive overload and decreased performance compared to low-stress participants when using the kiosk.	An adaptive interface is needed for vulnerable groups in the use of ICT.	South Korea
Cadieux, Camille, Cadieux, Gouin, Morin, & Fournier, 2024	Technostress or reaction to technostressors? Validation of bilingual technostressors index (TSI-II) and a second-order formative model of techno-distress among Canadian legal professionals	TSI-II has been proven valid for measuring technodistress in a second-order formative model.	Technostress should be understood as a process, not an end result.	Canada
Pagan-Garbin, Mendez, & Martinez-Ramon, 2024	Exploration of stress, burnout and technostress levels in teachers. Prediction of their resilience levels using an artificial neuronal network (ANN)	Resilience is inversely proportional to stress and technostress; ANN predicts resilience with 86.7% accuracy.	Personal accomplishment is important for teacher resilience.	Spain
Wekenborg, Förster, Schweden, Weidemann, Bechtolsheim, Kirschbaum, & Ditzen, 2024	Differences in Physicians' Ratings of Work Stressors and Resources Associated With Digital Transformation: Cross-Sectional Study	Digital transformation changes perceptions of work stressors depending on age, gender, and digital experience.	The effects of digital transformation are different, so you need to pay attention to individual factors.	Germany
Sitonen, Ritonummi, Salo, Pirkkalainen, & Mauno, 2025	Coping with technostress in the software industry: Coping strategies and factors underlying their selection	27 coping strategies were identified; influenced by personal and organizational factors.	Organizational support is important for effective coping.	Finland
Yang, Shamim, De Massis, & Gao, 2025	Defensive routines as coping mechanisms against technostress: roles of digital leadership and employee goal orientation	Defensive routines mediate the impact of technostress; digital leadership mitigates negative effects.	Effective digital leadership in managing technostress.	Pakistan
Shen & Kuang, 2022	Assessing the relationship between technostress and knowledge hiding a moderated mediation model	Technostress increases knowledge hiding through work exhaustion; influenced by job autonomy.	Work autonomy reduces the negative effects of technostress.	China
Bunjak, Černe, & Popovič, 2021	Absorbed in technology but digitally overloaded: Interplay effects on gig workers' burnout and creativity	Cognitive absorption encourages creativity, but overload causes burnout and reduces creativity.	Digital overload undermines the cognitive benefits of technology use.	USA, Canada
Sitonen, Ritonummi, Salo, Pirkkalainen, & Mauno, 2025	Coping with technostress in the software industry: Coping strategies and factors underlying their selection	Identify 27 coping strategies for technostress and the contextual factors that influence their selection.	Workers strive to cope, but there is insufficient organizational support.	Finland
Rasool, Warrach, & Sajid, 2022	Examining the Impact of Technology Overload at the Workplace: A Systematic Review	Technology overload causes work-life conflict, stress, and decreased productivity.	Training and time management are necessary to mitigate overload.	Pakistan
Kim & Lee, 2024	The mental health implications of artificial intelligence adoption: the crucial role of self-efficacy	AI adoption increases job stress → burnout, moderated by self-efficacy.	Self-efficacy can reduce stress from AI adoption.	South Korea
Kim & Lee, 2025	Self-efficacy in using artificial intelligence as a shield: mitigating the detrimental effects of organizationally prescribed perfectionism on employee stress and anxiety	Self-efficacy AI moderates the influence of perfectionism on stress and anxiety.	AI competency as a technostress protector	South Korea
Nedeljko, Gu, & Bostan, 2024	The dual impact of technological tools on health and technostress among older workers: an integrative literature review	Technology has a dual impact on the health and technostress of older workers, depending on the context and intervention.	Technology can either support or undermine the quality of work performed by older adults; evidence-based interventions are needed.	Multinational (EU, UK, Romania)

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Authors & Year	Title	Key Finding	Conclusion	Country
Keshavarz, Saeidnia, & Wang, 2025	Navigating technostress: a deep dive into health practitioners' technological challenges in hospital settings	41% of healthcare workers experience moderate technostress; main causes: technouncertainty, overload, complexity.	HR strategies are essential for mitigating technostress among employees.	Iran
Rademaker, Klingenberg, & Süß, 2025	Leadership and technostress: a systematic literature review	Supportive leadership reduces technostress, whereas control and high connectivity expectations increase it.	A digital leadership model that supports psychological well-being is needed.	Germany
Chuang, Chiang, & Lin, 2025	Insights from the Job Demands Resources Model: AI's dual impact on employees' work and life well-being	Technostress is not only a risk factor but also has the potential to be a challenge that can increase work engagement when combined with adequate work resources such as self-efficacy and organizational support.	Technostress can reduce work engagement, but its impact depends on psychological and organizational resources. The JD-R model effectively explains the moderating role of resources on the negative impact of technostress.	Germany
Sarfo, 2024	Artificial Intelligence Use, Technostress, and Academic Productivity among Students in Sub-Saharan Africa	Attitudes toward AI, prevalence of technostress, and impact on academic productivity of SSA students	AI can aid learning, but it can also cause technostress, which has a negative impact on academic productivity.	Ghana, Sub-Saharan Africa
Kaltenegger, Becker, Rohleder, Nowak, & Weigl, 2020	Association of working conditions including digital technology use and systemic inflammation among employees: Study protocol for a systematic review	Digital technology as a potential stress factor at work that may influence systemic inflammation	This study will examine the relationship between modern working conditions (including artificial intelligence technology) and inflammatory biomarkers; the results may have implications for occupational health policy.	Germany
Zolg, Heiden, & Herbig, 2021	Digitally connected work and its consequences for strain a systematic review	Digital connected work triggers cognitive, social, and organizational demands, affecting stress and well-being; physiological data is rarely used.	The relationship between digitally connected work and work pressure is complex; it is important to combine subjective and objective approaches for comprehensive results.	Germany
Wach, K. et al.	The dark side of generative artificial intelligence: A critical analysis of controversies and risks of ChatGPT	Seven risks of AI: regulation, content quality, job loss, privacy violations, social manipulation, social inequality, and technostress.	Emphasizing the need for regulation, digital skills training, and ethical development in the use of AI	Poland, Vietnam
Raj & Goute, 2025	Internal branding and technostress among employees - the mediation role of employee wellbeing and moderating effects of digital internal communication	Internal branding improves wellbeing and reduces technostress through internal digital communication.	Internal digital communication moderates and mediates the relationship between internal branding and technostress; the importance of branding and wellbeing strategies in managing digital work pressure	India
Kumar, 2024	TECHNOSTRESS: A comprehensive literature review on dimensions, impacts, and management strategies	Technostress consists of techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. Its impact on psychology, life balance, and work performance	Technostress has a widespread impact; intervention strategies are needed in organizations to mitigate its effects.	India
Li, Li, Zhong, & Yang, 2024	A scientometric analysis of technostress in education from 1991 to 2022	Increase in publications since the COVID-19 pandemic, main themes: technostress among teachers and students, effects of COVID, and strategies for coping	Technostress in education has increased post-COVID, requiring strategies to balance technology use and well-being.	China, USA, Spain, Malaysia, India
Li, Lim, & Ang, 2024	<i>An Analysis of Technostress Factors Among Teachers in Hunan, China Through Statistical Methods and K-means Clustering</i>	All technostress factors (techno-overload, -complexity, -insecurity, -uncertainty, -invasion, and adoption of new technology) have a significant effect on technostress. Teachers can be grouped into five clusters.	Technostress factors are significant and require different approaches for each group of teachers. Cluster results can assist the government in designing more targeted technology training based on the dominant type of technostress in each cluster.	China
Raj & Goute, 2025	Internal branding and technostress among employees	Internal branding improves wellbeing and reduces technostress through digital internal communication (DIC)	Wellbeing mediates the relationship between internal branding and technostress; DIC moderates the relationship.	India

Authors & Year	Title	Key Finding	Conclusion	Country
Kim & Kim, 2025	AI-environment paradox: Unraveling the impact of AI adoption...	AI adoption increases work overload and decreases pro-environmental behavior, especially when self-efficacy is low.	Work overload mediates, and self-efficacy moderates the impact of AI adoption on PEBW	South Korea
Ertiö, Eriksson, Rowan, & McCarthy, 2024	The role of digital leaders' emotional intelligence in mitigating employee technostress	Emotional Intelligence (EI) of digital leaders is important in reducing technostress	Digital leaders with high EI can reduce technostress through communication, transparency, and trust.	Finland, Ireland
Marsh, Vallejos, & Spence, 2022	The digital workplace and its dark side: An integrative review	The digital workplace can cause technostress, overload, and burnout if not managed properly.	A holistic approach is needed to understand the negative effects of the digital workplace	UK
Tams, Ahuja, Thatcher, & Grover, 2020	Worker stress in the age of mobile technology: The combined effects of perceived interruption overload and worker control	Interruption overload increases work-life conflict (WLC) and decreases the use of work technology.	WLC mediates the relationship between overload and technology use; control moderates that relationship.	USA, Canada
Nascimento, Correia, & Califf, 2024	Towards a bright side of technostress in higher education teachers: Identifying several antecedents and outcomes of techno-eustress	Techno-eustress meningkatkan kepuasan kerja dan kinerja HETs	Positive techno-eustress is influenced by useful technology and organizational support.	Portugal
Shin & Shin, 2024	Effects of Technostress on Psychological Contract Violation and Organizational Change Resistance	Technostress berdampak signifikan terhadap pelanggaran kontrak psikologis dan resistensi terhadap perubahan organisasi.	Psychological contract violations mediate the relationship between technostress and resistance to organizational change	South Korea
Muhamad et al., 2025	Technostress and its associated factors: Burnout and fatigue among Malaysian healthcare workers (HCWs) in state hospitals	Technostress levels are dominant; burnout and fatigue are significantly correlated with technostress.	The need for psychological intervention to reduce the impact of technostress in the health sector	Malaysia
Lițan, 2025	The Impact of Technostress Generated by Artificial Intelligence on the Quality of Life: The Mediating Role of Positive and Negative Affect	There is no direct effect of technostress on quality of life, but there is a mediating effect through positive and negative affect.	Emotional affect (positive/negative) mediates the impact of AI-based technostress on quality of life	Romania
Xia, 2023	Co-working with AI is a Double-sword in Technostress? An Integrative Review of Human-AI Collaboration	Human-AI collaboration produces both techno-eustress (positive) and techno-distress (negative); job insecurity and complexity are the main technostressors.	Collaboration with AI can be positive or negative stress depending on perception; organizational support is important	USA

## Study Characteristics and Research Trends

The included studies demonstrated a clear increase in scholarly attention to technostress in AI-enabled and digitally intensive environments over time. The systematic search identified an increasing number of studies examining the relationship between Artificial Intelligence (AI) and technostress between 2019 and 2025. The first publication appeared in Although early publications were limited in number, research activity expanded markedly after 2020, coinciding with the accelerated adoption of AI technologies across organizational and public sectors. This upward trend reflected growing concern about the psychological consequences of automation, algorithmic decision-making, and digitally mediated work processes.

The empirical evidence covered a wide range of occupational settings, including healthcare, education, software development, public administration, and knowledge-intensive industries. Most studies focused on employees and professionals who routinely interacted with advanced digital systems or AI-based applications as part of their daily work. Across these contexts, technostress was consistently linked to increased workload, cognitive strain, and diminished well-being, although the magnitude and form of these effects varied.

From a geographical perspective, the studies were conducted across multiple regions, including Europe, East Asia, South Asia, North America, and parts of Africa. However, the distribution was uneven. Research output was concentrated in technologically advanced economies, while emerging and developing contexts were comparatively underrepresented. Studies conducted in these latter settings often highlighted additional challenges related to digital infrastructure, skills gaps, and organizational readiness, suggesting that broader socio-economic and institutional conditions shaped technostress experiences. These descriptive patterns were

consistent with the bibliometric mapping, which showed a marked increase in publication volume and keyword clustering around AI, technostress, and employee well-being during periods of intensified AI adoption.

### **Methodological Characteristics of Included Studies**

In terms of research design, the literature was dominated by quantitative approaches. Most studies employed cross-sectional survey methods to examine relationships between technostress, psychological outcomes, and work-related variables. Standardized questionnaires were commonly used to measure technostress dimensions, burnout, work engagement, and related constructs. While these designs provided valuable snapshots of employee experiences, they limited insight into temporal dynamics and causal mechanisms.

A smaller number of studies adopted qualitative or mixed-method approaches. Qualitative investigations, often based on interviews or open-ended responses, offered deeper insight into subjective experiences, coping strategies, and sense-making processes associated with AI use. Mixed-method studies combined survey data with qualitative analysis to enrich interpretation, although such designs remained relatively rare.

Longitudinal and experimental designs were notably scarce. Only a limited subset of studies examined changes in technostress over time or assessed the impact of specific organizational or technological interventions. This methodological imbalance suggested that the current understanding of AI-induced technostress was largely grounded in short-term perceptions rather than developmental or process-oriented evidence. This methodological concentration mirrored the bibliometric structure of the field, where dominant research clusters were shaped by survey-based designs and short-term empirical assessments of technostress outcomes

### **Theoretical Frameworks Used in AI–Technostress Research**

Analysis of the included studies indicated that several theoretical frameworks were used to explain the relationship between AI adoption and technostress. The Technostress Model served as the most frequently applied framework, providing a foundation for identifying stressors such as overload, complexity, insecurity, invasion, and uncertainty. Many studies extended these dimensions to account for AI-specific features, including algorithmic opacity and automation anxiety.

The Job Demands- Resources (JD-R) model was also widely employed, particularly in studies examining the dual role of AI as both a source of strain and a potential resource. Within this framework, AI-related demands such as increased cognitive effort or skill adaptation were contrasted with resources including self-efficacy, resilience, and organizational support. Findings consistently suggested that the availability of resources moderated the negative effects of technostress on well-being and performance.

Technology adoption theories, including the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), were applied in a smaller subset of studies. These frameworks were typically used to explain how perceived usefulness, ease of use, and facilitating conditions shaped employees' responses to AI systems. In addition, a limited number of studies drew on the Task-Technology Fit (TTF) perspective to examine alignment between AI functionalities and job requirements. Overall, most studies relied on a single theoretical lens, with relatively few attempts to integrate multiple frameworks within a unified explanatory model. This reliance on established frameworks was reflected in the bibliometric keyword network, in which constructs associated with job demands, resources, stress, and well-being occupied central and highly interconnected positions.

## **Integrating Bibliometric Mapping and Systematic Synthesis**

When considered jointly, the bibliometric mapping and systematic synthesis revealed a coherent and mutually reinforcing picture of AI-technostress research. Bibliometric analysis captured the structural evolution of the field, highlighting rapid growth in publications and the consolidation of key conceptual clusters. The systematic review, in turn, explained the substantive drivers underlying these patterns by identifying recurring psychological mechanisms, outcomes, and moderating factors.

In particular, the prominence of keywords related to burnout, well-being, and stress in the bibliometric network aligned closely with systematic evidence showing that cognitive overload, techno-complexity, and automation-related insecurity were the most frequently examined pathways linking AI use to adverse psychological outcomes. Similarly, the increasing visibility of terms associated with leadership, coping, and organizational support reflected empirical findings that these factors consistently shaped whether AI functioned as a job demand or as a resource.

Geographical patterns observed in the bibliometric analysis further complemented the systematic synthesis. Regions with higher research output tended to produce studies grounded in well-established theoretical frameworks, whereas studies from underrepresented contexts more often emphasized structural constraints, such as limited infrastructure, skill gaps, and organizational readiness. These contextual differences were mirrored in the diversity of stressors and coping mechanisms identified across the empirical literature.

Taken together, this integration demonstrated that bibliometric mapping addressed where and how AI-technostress research had developed, while systematic synthesis clarified why particular constructs, theories, and outcomes dominated the field. The hybrid approach, therefore, strengthened the explanatory power of the review, positioning AI-induced technostress as a consolidated yet evolving research domain rather than a fragmented extension of earlier ICT stress studies.

## **Discussion**

The bibliometric trend demonstrates a clear and accelerating growth of publications examining the intersection between Artificial Intelligence (AI) and technostress. The number of studies increased gradually from 2019 to 2021, reaching a significant surge in 2023 and reaching its highest point in 2024. Preliminary indicators for 2025 suggest the persistence of this upward trend. This escalation is congruent with the accelerated international propagation of artificial intelligence (AI) applications, including automation, predictive analytics, and generative AI. This has precipitated a marked surge in scholarly interest concerning the psychological, behavioral, and organizational ramifications of AI integration.

Across the 34 articles included in this review, it is evident that AI-induced technostress has emerged as a global phenomenon. Research originates not only from technologically advanced nations but also increasingly from developing countries, indicating that concerns about the psychological impacts of AI transcend socio-economic boundaries. The proliferation of studies across sectors ranging from education and healthcare to software engineering, government, and general workplace settings highlights the widespread relevance of AI-related stressors. These studies consistently show that AI introduces new psychological pressures that are more intricate than those found in earlier forms of technology, due to its autonomous decision-making, rapid evolution, and high cognitive demands.

Bibliometric mapping identifies China as the predominant contributor to AI technostress research, reflecting its national agenda of digital transformation and large-scale AI implementation. China has emerged as a global leader in research on artificial intelligence and technostress, as evidenced by its substantial contributions to this field (Horowitz, 2022). These sources indicate that China is among the countries experiencing the most rapid growth in AI publications on a

global scale. This finding aligns with global reports that identify China as a prominent center for AI research, with a growing focus on human factors such as adaptation, stress, and fatigue (Li & Zhang, 2021). Interest in AI-induced technostress is distributed across continents, as evidenced by the inclusion of high contributing countries such as Spain, Germany, India, and South Africa. Furthermore, the recent contributions from Indonesia, Malaysia, Morocco, and Egypt underscore the global significance of this subject. These geographic patterns underscore the importance of considering cultural variability, digital infrastructure readiness, and human capital development when interpreting empirical findings (Tarafdar et al., 2015).

The thematic synthesis indicates that AI-related technostress operates primarily through three pathways: techno-overload, techno-complexity, and techno-insecurity (Ragu-Nathan et al., 2008). The phenomenon of techno-overload emerges as artificial intelligence (AI) increases work demands, introduces continuous learning pressures, and accelerates the pace of decision-making. The concept of techno-complexity emerges from the difficulty of understanding or operating AI systems, particularly when algorithmic processes are opaque or unpredictable. Techno-insecurity, defined as an apprehension concerning the impact of automation and intelligent systems on employment stability, is a salient concern in contemporary discourse. These mechanisms are considered extensions of classical technostress creators, thereby demonstrating that AI amplifies existing stressors while introducing new psychological challenges linked to automation and perceived loss of control.

From a theoretical standpoint, the observed patterns are consistent with the Technostress Model, which posits that the proliferation of technology, its encroachment into various domains, the resulting inundation of information, and the pervasive sense of uncertainty can adversely impact user well-being and performance, unless counterbalanced by organizational support mechanisms (Ragu Nathan, 2008). The Job Demands-Resources (JDR) Theory offers further explanatory power by demonstrating that AI has the capacity to function as both a job demand, engendering strain through cognitive overload, time pressure, and uncertainty, and a job resource, enhancing efficiency, autonomy, and engagement when utilized effectively (Bakker, 2007). Empirical evidence has demonstrated that human-AI collaboration can yield both "dark" outcomes, such as burnout, fatigue, and anxiety, and "light" outcomes, including motivation and performance enhancement. These outcomes are contingent upon the users' assessment of the technology (Xia, 2023).

The dynamics of this phenomenon are further illuminated by theories of technology adoption. The Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) posit that perceived usefulness, ease of use, and facilitating conditions predict adoption intentions (Davis, 1989). However, technostress, particularly when induced by artificial intelligence (AI), can impede these intentions by inducing anxiety, a perceived lack of control, or misalignment between user expectations and system behavior (Venkatesh et al., 2003).

Methodologically, the majority of studies employed quantitative cross-sectional designs, indicating that current knowledge of AI-induced technostress is largely based on users' immediate perceptions rather than longitudinal behavioral change. Qualitative and mixed methods studies have been limited in scope, yet they have yielded significant insights into emotional responses, coping mechanisms, and adaptation trajectories. Across various contexts, the integration of AI has been shown to introduce heightened complexity, the need for rapid adaptation, and disruptions to traditional work roles. These dynamics give rise to a range of psychological effects, including increased workload, job uncertainty, and pressure to continually update digital competencies. This pattern has been observed among teachers in Spain, healthcare staff in Iran, and employees in knowledge-intensive industries.

Bibliometric keyword analysis reinforces these findings, highlighting an increase in themes such as burnout, AI anxiety, digital stress, and mental health. The prominence of these terms reflects a growing recognition of AI's psychological consequences and aligns with broader

discussions on how digital transformation affects employee well-being. Notably, coping mechanisms and organizational support also appear frequently, indicating a shift toward research that explores strategies to buffer technostress and enhance resilience.

Several recent studies into individual and organizational moderators demonstrate that adaptive coping strategies, resilience, and supportive work environments can mitigate AI-induced technostress. For example, Kim et al. (2022) show that cognitive overload can be minimized through adaptive interface design, while Cadieux et al. (2024) emphasize the dynamic and evolving nature of technostress. Pagán-Garbín et al. (2024) identify resilience as a significant buffer against stress, and Siitonen et al. (2025) document 27 coping strategies used in software development environments, underscoring the importance of organizational readiness and support. Shahzad (2024) find that showing that embracing AI can have a positive impact on student performance and well-being.

These contradictory findings highlight that AI-induced technostress is not a linear phenomenon; instead, it represents a dynamic process moderated by user characteristics, task requirements, and organizational context. The integration of JD–R, UTAUT, TAM, and TTF in this review suggests the need for a more holistic theoretical model that captures the interplay between cognitive demands, perceived usefulness, emotional responses, and task alignment.

Collectively, these insights demonstrate that AI-induced technostress is a multidimensional and evolving psychological phenomenon. Its complexity underscores the need for integrated theoretical frameworks and robust empirical designs capable of capturing the dynamic interactions between individuals, technology, and organizational structures. By integrating bibliometric mapping with systematic thematic synthesis, this study not only identifies where and how AI-technostress research has developed globally, but also explains why certain psychological mechanisms, theoretical frameworks, and coping strategies dominate the field

## **Conclusion**

This review suggests that Artificial Intelligence (AI) is reshaping the nature, sources, and psychological pathways of technostress, extending it beyond traditional forms of technology-related strain. The analysis of 34 empirical studies indicates that AI induces technostress through mechanisms of cognitive overload, algorithmic complexity, rapid automation, and perceived loss of control dimensions that align with but also evolve beyond classical technostress creators. The surge in global publications since 2023 reflects growing scholarly and practical concern about the psychological implications of AI adoption across industries and populations.

From a theoretical perspective, this review contributes by synthesizing the Technostress Model, Job Demands–Resources (JD–R) framework, technology acceptance theories (UTAUT/TAM), and Task–Technology Fit (TTF) to explain why AI can simultaneously function as a challenge and a hindrance stressor (Goodhue & Thompson, 1995). This synthesis highlights that AI is not only a technological demand but may also function as a structural force influencing job roles, emotional wellbeing, and perceptions of human–machine agency.

Practically, the review underscores the need for organizations to adopt proactive, psychologically informed AI implementation strategies. Transparent communication, AI literacy training, supportive work environments, and responsible automation policies appear to be important for mitigating technostress and promoting user empowerment. Methodologically, the review identifies critical gaps in longitudinal, cross-cultural, and intervention-based research, emphasizing the urgency for future studies that examine AI-induced technostress dynamically over time and across diverse work settings.

Overall, the review suggests that managing technostress in the age of AI requires a shift from treating technology as a neutral tool toward understanding AI as a socio-technical actor that interacts with individual cognition, organizational structures, and broader sociocultural contexts. This nuanced understanding offers a foundation for developing more comprehensive theoretical

models and evidence-based strategies to foster healthy, sustainable, and **human-centered** AI integration.

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