

R-BASED BIBLIOMETRIC ANALYSIS OF TECHNOSTRESS RESEARCH

ANÁLISE BIBLIOMÉTRICA BASEADA EM R DA PESQUISA SOBRE TECNOESTRESSE

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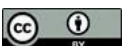
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Abstract

The study aims to create a map by presenting analyses of leading researchers in the field, other authors collaborating with these researchers, journals with the highest number and quality of publications, the most frequently used words, the thematic structure of the field, leading countries, and other countries collaborating with these countries. Within this scope, a total of 1,297 English academic publications in the Web of Science database were analysed using the Bibliometrix and Biblioshiny packages in the R programming language. Riedl, Tarafdar, and Maier are leading researchers in the technostress literature. The analysis identified three main theoretical areas. These areas are: information systems and stress theory, technology acceptance and adaptation models, and organisational psychology. Popular topics that will be important for future work in the field are techno-eustress (positive stress from technology) and techno-distress (negative stress from technology). The United States, China, and Germany are the countries that contribute most to the field through their international collaborations. Unlike other bibliometric studies that examine technostress more broadly as part of technology-induced stress research, this study focuses solely on the concept of technostress and presents different results for its conceptual structure, which is the most important reason for the uniqueness of this study.

Resumo

O estudo visa criar um mapa apresentando análises dos principais pesquisadores da área, outros autores que colaboram com esses pesquisadores, revistas com o maior número e qualidade de publicações, as palavras mais utilizadas, a estrutura temática da área, os países líderes e outros países que colaboram com esses países. Dentro desse escopo, um total de 1.297 publicações acadêmicas em inglês na base de dados Web of Science foram analisadas utilizando os pacotes Bibliometrix e Biblioshiny na linguagem de programação R. Riedl, Tarafdar e Maier são pesquisadores líderes na literatura sobre estresse tecnológico. A análise identificou três áreas teóricas principais. Essas áreas são: sistemas de informação e teoria do estresse, modelos de aceitação e adaptação da tecnologia e psicologia organizacional. Tópicos populares que serão importantes para trabalhos futuros na área são o estresse tecnológico positivo (estresse positivo proveniente da tecnologia) e o estresse tecnológico negativo (estresse negativo proveniente da tecnologia). Os Estados Unidos, a China e a Alemanha são os países que mais contribuem para o campo por meio de suas colaborações internacionais. Ao contrário de outros estudos bibliométricos que examinam o estresse tecnológico de forma mais ampla como parte da pesquisa sobre estresse induzido pela tecnologia, este estudo se concentra exclusivamente no conceito de



Keywords: Bibliometric Analysis. R-Based Analysis. Technostress.

estresse tecnológico e apresenta resultados diferentes para sua estrutura conceitual, o que é a razão mais importante para a singularidade deste estudo.

Keywords: *Análise Bibliométrica. Análise Baseada Em R. Tecnoestresse.*

1 INTRODUCTION

The primary objective of this study is to comprehensively review the technostress literature and map the studies in this field. To this end, 1,297 English-language academic studies in the Web of Science database were examined using bibliometric analysis methods. To ensure linguistic consistency, only articles published in English were considered in this study. Using the ‘Bibliometrix’ and ‘Biblioshiny’ packages within the R programme, the publication growth rate by year, the authors, journals and countries with the most publications in the field, and the collaborative work carried out by all these elements were examined. As a result of this examination, an attempt was made to reveal the thematic structure of the field. This study sought to reveal the intellectual structure of the field of technostress and to create a roadmap for future research. The study addresses the following research questions:

(1) How have academic studies in the field of technostress developed over the years?

This question seeks answers regarding the trends and turning points in technostress research over the years up to 2025.

(2) Who is the most prolific author in technostress research?

The aim is to identify the authors who have contributed to the technostress literature and, in particular, the researchers who have guided the empirical development of the field.

(3) How many technostress studies are published in scientific journals, and what is the contribution of these journals to the field of technostress?

The aim here is to identify the publication vehicles contributing to the field and to understand the contribution of these vehicles to the field's visibility.

(4) What are the words frequently used together in technostress research? How are words frequently used together in the field grouped into thematic clusters?

This question will analyse the conceptual structure by examining the thematic areas formed by frequently used words and the organisation of these areas.

(5) What are the citation counts of studies in the field? Which studies receive the most citations? Which cluster do the most cited studies represent?

This question supports understanding the fundamental structures that shape the concept of technostress and defining the theoretical basis of these structures.

(6) Which countries have contributed most to the technostress literature? Which of these countries have pioneered international collaborations?

This question is critical in characterising the global research environment and different collaboration models in the technostress literature.

The findings of this research will contribute to both the technostress literature and the world of work. For researchers wishing to contribute to the field of technostress, this study will provide a broad perspective, including the status of pioneering researchers, data from key journals contributing to the field, and detailed information on fundamental concepts. Human resources managers, information systems designers, and digital transformation specialists provide support in important organisational processes such as strengthening and regulating various support mechanisms for employees in the digitalisation processes of organisations, strengthening organisational information systems, and employee adaptation.

2 CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

The constant and rapid changes occurring in the digital world have triggered the development of a distinct type of stress, termed ‘technostress’ in the literature, arising from individuals' interactions with information and communication technologies. When the concept was first defined, it was described as an adjustment disorder (Tarafdar *et al.*, 2007). This adaptation problem experienced at the individual level stems from rapid technological changes. In subsequent periods, the definition of the concept was expanded to include cognitive, behavioural, and emotional dimensions based on the relationship between the individual and technology (Keshavarz *et al.*, 2025).

In addition to its individual-level effects such as role stress, burnout, and decreased job satisfaction, technostress also has negative consequences at the organisational level, such as low productivity and reduced organisational commitment.

The intensive remote working and active use of artificial intelligence-based systems that became part of our lives during the pandemic have made technostress and its negative consequences more visible. The concept of technostress has also begun to emerge in the fields of organisational sustainability, digital transformation, and human resources (Jain *et al.*, 2025).

The concept of technostress, which has been studied since 1980, was first proposed by American scientist Craig Brod. Brod defined the concept as the adaptation problem experienced by individuals in the face of developing technologies (Salazar-Concha *et al.*, 2021). Weil and Rosen expanded on the concept in 1997. According to this new definition proposed by researchers, the concept also encompasses attitudes, behaviours, and thoughts. Technostress will cause changes by creating various effects on individuals' attitudes, behaviours, and thoughts (Wang & Shu, 2008).

The concept was addressed from an organisational perspective in 2007 (Kot, 2022). The study conducted by Tarafdar and colleagues indicated that rapid changes in information and communication technologies would create pressure on individuals and organisations in various dimensions. Changing conditions would give rise to changing requirements, leading to the perception of various obstacles that individuals would have to overcome. This perception will also form the main source of their stress (Tarafdar *et al.*, 2007). The studies conducted by Tarafdar and colleagues led to the field being transferred to the organisational sphere (Buzas *et al.*, 2025). As a result of the study, five basic sub-dimensions determining the technostress levels of individuals and, consequently, organisations were identified. These dimensions are: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty.

In a study conducted by Ragu-Nathan, Tarafdar and others in 2008, technostress creators and technostress inhibitors were examined together. It was observed that technostress creators had a negative impact on job satisfaction, organisational commitment and commitment to continuity. Conversely, technostress preventers were seen to have positive effects on job satisfaction and commitment. In this study, the following were identified as technostress preventers: technical support, user training, and participatory implementation processes (Ragu-Nathan *et al.*, 2008). A study supporting this research was also conducted by Kumar in 2024. This study highlighted the concepts of technology user training, digital awareness, ergonomic adjustments, and digital detox (Kumar, 2024).

Another study conducted in 2008 indicated that technostress has a positive relationship with role conflict and role overload. According to this study, the increase in technological demands arising from technological changes and developments will cause a significant increase in the level of role stress experienced by employees (Mishra, 2022). Another finding from the study was that perceived organisational support significantly weakened the relationship between technostress and role conflict. This highlights the importance of organisational support in enabling employees to cope with stress (Hassan *et al.*, 2019).

In another study conducted by Tafdar and colleagues in 2019, they determined that organisations could design their information systems in a way that reduces employees' levels of technostress, thereby increasing organisational efficiency (Salazar-Concha *et al.*, 2021). The researchers identified two fundamental dimensions that influence technostress. Technology positive stress and technology negative stress represent these two different dimensions. The concept of technology positive stress refers to the individual perceiving the characteristics of information systems as a challenge and considering it an opportunity, where the individual consciously perceives these opportunities in a way that will lead to positive outcomes (Tarafdar *et al.*, 2019).

Zhao and colleagues sought to understand developments in information and communication systems from the perspective of employees in their 2020 study. The results of this study showed that employees' perception of these changes influenced the impact of developments in information and communication systems on organisational efficiency (Le Roux & Botha 2021). When employees perceive developments in information and communication technologies as a challenge or as an opportunity for growth for themselves and their organisations, their productivity levels will increase. Conversely, when employees perceive developments in information and communication technologies as an obstacle, their productivity will be negatively affected. In the literature, technostress supported by information and communication systems and the resulting productivity studies have been examined based on the transactional theory of stress. The results obtained from research conducted in this direction have revealed that technology overload and technology uncertainty create a perception of challenge, whereas technology complexity and technology insecurity create a perception of hindrance. Coping strategies developed to solve problems have a positive effect on organisational and individual productivity, while emotion-focused coping strategies can negatively

affect productivity. These results show that technostress is not inherently a negative concept and that positive outcomes can be achieved at the individual and organisational levels if the right strategies are applied.

A significant study examining technostress among employees at various organizational levels was conducted in Sweden in 2021 by Stadin *et al.* (2021). The study revealed that managers face higher levels of information and communication technology demands than other occupational groups (Schubin *vd.*, 2023). This high demand has been noted to lead to negative outcomes such as stress, cognitive difficulties, and health problems in the workplace. Furthermore, it has been suggested that the digital workload of managers may increase their risk of leaving their jobs and their likelihood of experiencing burnout (Stadin *vd.*, 2021).

Another important factor is that a significant portion of the studies forming the technostress literature have been shaped within the framework of the interactive stress model. The interactive stress model evaluates the concept of stress as a process. In this process, the fundamental factor determining an individual's stress is environmental demands. In the study conducted by Tarafdar and colleagues in 2007, information and communication technologies were considered as an environmental demand. The constant change in information and communication systems and the complexity arising from these changes will cause the individual to perceive that they cannot meet these demands. This perception will increase the individual's stress level, causing them to experience role conflict or role ambiguity within the organisation. At the end of this process, the individual's productivity will decrease (Tarafdar *et al.*, 2007). The technology acceptance model is another fundamental structure that has been extensively studied in technostress research. In this model, the critical factors determining employees' stress levels are their perceptions of technological benefits, ease of use, and acceptability (Wang & Shu 2008). A group of studies has been conducted within the framework of the Job Demands-Resources Theory. The vast majority of studies within the Job Demands-Resources Theory framework have addressed themes such as burnout, organisational commitment, and job involvement (Hwang & Cha, 2018).

Technostress is receiving increasing attention in the literature. This interest has become particularly evident since 2017. Publications related to technostress are concentrated in a few journals and among a few author teams. Tarafdar and Ragu-Nathan, in particular, occupy a central position in this field (Bondanini *vd.*, 2020). Their analysis

reveals that the core factors underlying technostress include information overload, role ambiguity, technology dependency, and work-life imbalance. Researchers emphasize that technostress negatively affects job satisfaction, organizational commitment, and employee productivity (Hassan vd., 2019). Organizations should focus on providing individual support and technical assistance systems during technology adaptation processes (Marsh vd., 2022).

3 METHODOLOGY

2.1 Sources and data

Studies of bibliometric analysis investigate the evolutionary and structural processes of a scientific field (Cobo vd., 2011; Noyons vd., 1999; Börner vd., 2003). In other words, these studies provide a detailed map of a specific field of study (Aria vd., Cuccurullo 2017). This study is such a map, created to evaluate the academic standing of the technostress phenomenon.

The data collection process began with entering the keyword "technostress" into the Web of Science (WoS) database search field. A total of 1,334 studies were found. However, to ensure linguistic consistency, only studies published in English were selected for analysis. After filtering, 1,297 academic publications remained, as shown in Table 1 under "Documents." This number indicates a medium-sized literature pool. The dataset obtained from Web of Science was exported in BibTeX format. The exported data were loaded into the Bibliometrix package running in the R programming language environment.

The data was analyzed by year of publication, leading authors, journals, and countries. A map was created by evaluating the field's thematic development and the networks formed by collaborations between authors in different countries. The Bibliometrix and Biblioshiny packages in the R program were used to create the map. The bibliometric analysis obtained from the R program and presented in Table 1 provides basic information about the subject.

Table 1*The main information about data.*

Des	Description	Value	Value
Timespan		1982–2025	
Sources (Journals, Books, etc.)		585	
Documents		1297	
Annual Growth Rate		11.55%	
Authors		3371	
Authors Of Single-Authored Documents		117	
International Co-Authorship (%)		25.98%	
Co-Authors per Document		3.55	
Author's Keywords (DE)		3451	
References		52079	
Document Average Age		4.38	
Average Citations Per Document		26.83	

Examining Table 1 reveals that studies related to technostress have steadily increased in the literature. One indicator of this growth is the 1,297 academic studies published in 585 sources, including journals and books, between 1982 and 2025. A total of 3,371 authors contributed to these studies. Of these studies, 117 are single-authored, and the average number of co-authors per study is 3.55. This result undoubtedly indicates a strong culture of collaboration in the technostress literature. Technostress-related production has grown at an annual rate of 11.55%. The rate of international co-authored studies (25.98%) indicates intercultural interaction, diversity, and contributions from different disciplines in the field. The average age of studies in this field is 4.38 years. This data shows that the field remains current. Another indicator of the field's visibility is the number of citations per publication. Table 1 shows that the average number of citations per publication is 26.83.

2.2. Bibliometric analysis tools

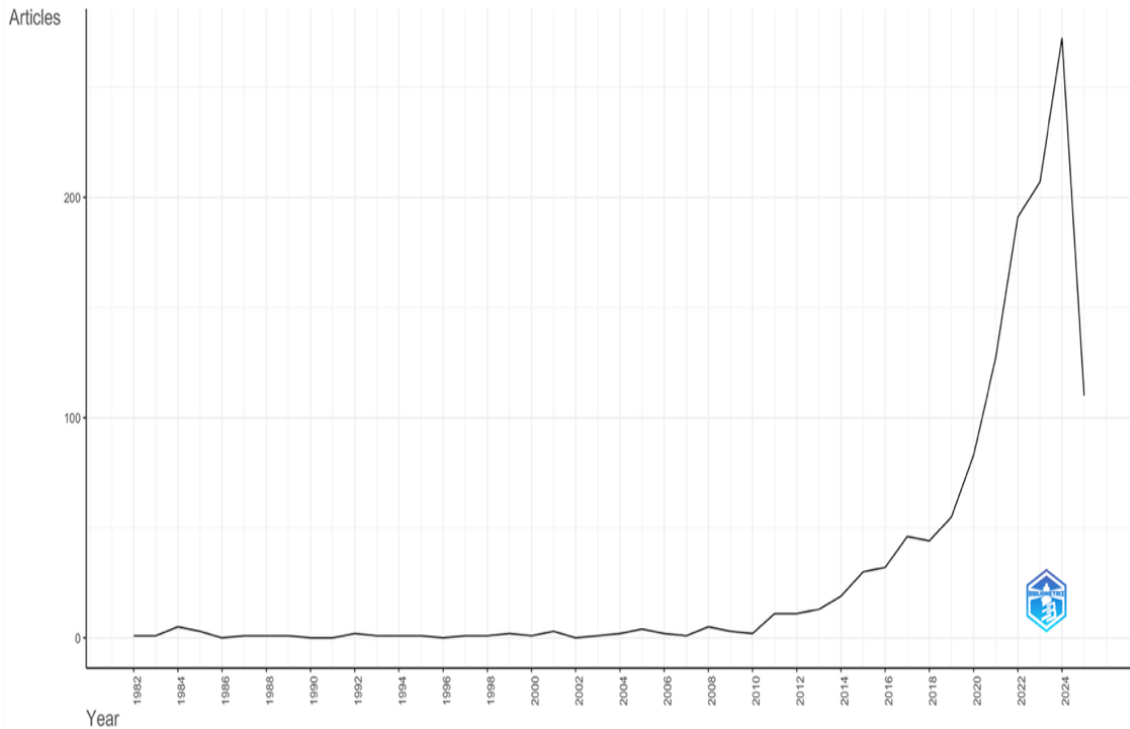
This study used various bibliometric analysis tools to map the phenomenon of technostress. The Bibliometrix and Biblioshiny packages in the R programming language were used to analyze the dataset obtained from the Web of Science database (Rajendran vd., 2023). These tools helped identify leading authors, journals, and countries in the field and enabled the evaluation of these elements' impact levels using various criteria (Hirsch, 2005).

The analysis tools used in this study do not focus solely on the publication performance of the analyzed publications, journals, authors, and countries. They also enable content-based scientific mapping based on publication content (Hirsch, 2005). To this end, techniques such as keyword co-occurrence, thematic clustering, and visualization of collaboration networks were employed.

3 FINDINGS

The first studies on technostress were conducted in the early 1980s (Alam, 2016). These studies included the articles "Technostress: Old Villain in New Guise," published in the July 1982 issue of *Occupational Health & Safety*; and "Managing Technostress: Optimizing the Use of Computer Technology," published by Craig Brod in 1982, are pioneering works in the field (Salazar-Concha vd., 2021).

The conceptual establishment of technostress in literature is based on Brod's 1984 book *Technostress: The Human Cost of the Computer Revolution*" (Siitonen vd., 2025). During this period, studies related to the field were limited in number. The number of technostress studies began to increase in 2007. As shown in Figure 1, there has been a steady increase in technostress studies since 2012.

Figure 1*Annual Scientific Production.*

Between 2012 and 2018, there was a gradual increase. During this time, the subject began to gain recognition in academia. From 2019 to 2023, the field experienced an explosion. Notably, the number of technostress studies produced annually has exceeded 250 since 2022. Reasons for this increase include increased digitalization during the pandemic and interest in topics such as remote work and artificial intelligence, which were brought about by digitalization.

Table 2*Most relevant authors.*

Authors	Articles	Articles fractionalized
RIEDL R.	34	14.45
TARAFDAR M.	30	8.44
MAIER C	27	7.04
WANG X	20	6.27
LAUMER S	16	3.68
SALO M	14	3.67
WEITZEL T	14	3.68
PIRKKALAINEN H	13	3.33
STANGL FJ	11	4.9
TAMS S	11	4.5

Table 2 shows the researchers who have conducted the most work in the field of technostress and are pioneers in the field. Table 2 shows that Riedl R. has conducted the most work in the field of technostress. Riedl R. has conducted a total of 34 academic studies related to technostress. The term ‘Article fractionalised’ in Table 2 indicates the collaboration of researchers with different authors. If a researcher has been heavily involved in multi-authored work, the relevant value will be low. Researchers such as Laumer S. and Salo M. have low ‘Article fractionalised’ values. This indicates that the researchers in question played an active role in multi-authored studies. Upon examining the table, it can be seen that another researcher who contributed most to the field is Tarafdar M. Tarafdar has conducted a total of 30 academic studies on technostress. Another important researcher in the field is Maier C. The researcher has conducted a total of 27 studies.

Figure 2

The authors’ production over time in graphene generated by bibliometrix.

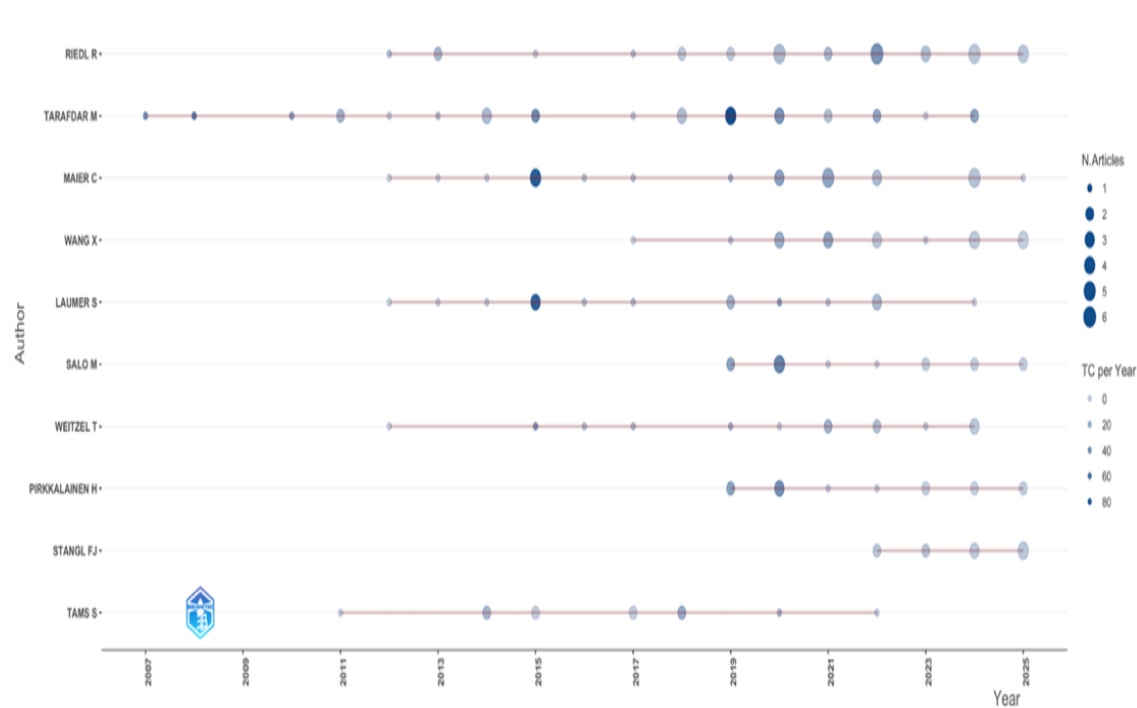
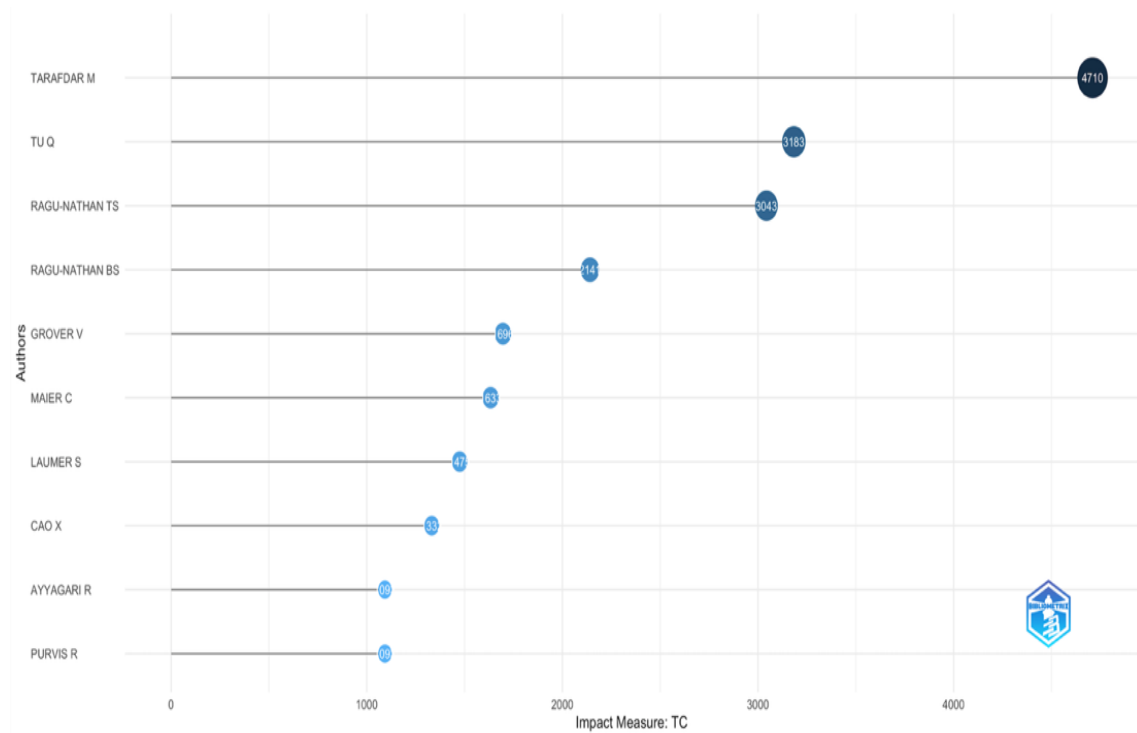


Figure 2 is a bubble chart showing the annual number of publications by ten authors considered pioneers in the field of technostress, as well as the number of citations these publications received, between 2007 and 2025. Tarafdar, Riedl, and Maier stand out in the technostress literature due to their high publication volume and level of influence.

Notably, 2015 demonstrates significant productivity and resulting citations for these authors. Laumer S. and Salo M. have made similar contributions. Examining the periods after 2020 reveals that new authors, such as Wang X. and Pirkkalainen H., are beginning to emerge. The size and darkness of the bubbles represent the number of publications and the citation level, respectively. Examining the data reveals that the field of technostress is attracting more attention and an effective knowledge network is forming around certain authors.

Figure 3

Authors' local impact in technostress research by total citations.



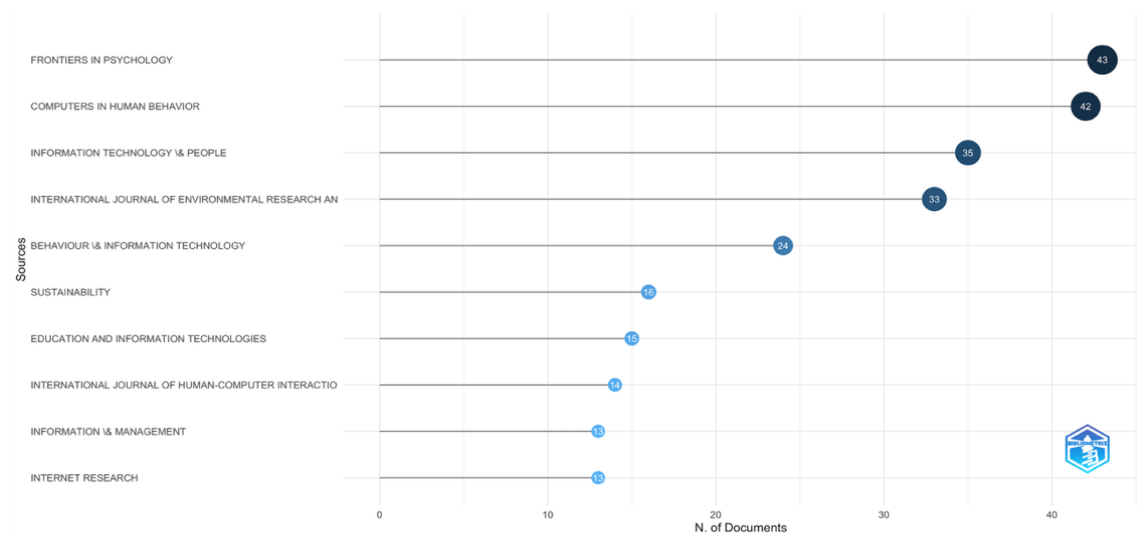
Typeset sub-subheadings in medium face italic and capitalize the first letter of the first word only. Section numbers to be in roman. In this analysis, which evaluates authors based on their total citation counts, M. Tarafdar emerges as the leading researcher in the field, with a total of 4,710 citations (Tarafdar, 2015; Tarafdar vd., 2007). Following Tarafdar are Q. Tu with 3,183 citations and T. S. Ragu-Nathan with 3,043 citations (Ragu-Nathan vd., 2008; Tu vd., 2005). The analysis indicates that these three authors have played a pioneering role in establishing the theoretical foundations of the technostress concept and advancing research in this domain.

Authors such as B. S. Ragu-Nathan, V. Grover, C. Maier, and S. Laumer are identified as mid-level contributors who have enriched the field through their interdisciplinary work at the intersection of information systems, organizational behavior, and psychology (Maier vd., 2015; Laumer vd., 2016). Although X. Cao, R. Ayyagari, and R. Purvis have produced fewer studies compared to other scholars, their works have provided valuable insights into specific subfields of technostress research (Ayyagari vd., 2011; Cao & Sun, 2018).

Overall, this analysis reveals the presence of a small group of leading authors who play a central role in the academic production and intellectual development of technostress research (Tarafdar vd., 2019).

Figure 4

The most relevant sources in graphene generated by bibliometrix



Examining Figure 4 and Table 3 reveals the journals that publish the most on technostress. "Frontiers in Psychology" and "Computer in Human Behavior" are the most influential journals focusing on the psychological and behavioral dimensions of the field.

Table 3*Most relevant sources*

Sources	Articles
Frontiers in psychology	43
Computers in human behavior	42
Information technology & people	35
International journal of environmental research and public health	33
Behaviour & information technology	24
Sustainability	16
Education and information technology	15
International journal of human-computer interaction	14
Information & management	13
Internet research	11

These findings demonstrate that technostress is a human-centered issue addressed by academic studies. Journals such as Information Technology & People and Behavior & Information Technology prioritize research examining the relationship between individuals and technology. On the other hand, journals such as Sustainability and International Journal of Environmental Research and Public Health examine the effects of technostress on organizational sustainability and health. The interdisciplinary nature of technostress is striking when the data is examined.

Table 4*The sources' local impact*

Schedule	Tc	Np
Computers in Human Behavior	4791	42
International Journal of Environmental Research and Public Health	1433	33
Information Technology & People	863	35
Frontiers In Psychology	731	43
Information Systems Journal	2103	12
Sustainability	667	16
Behaviour & Information Technology	278	24
Information & Management	818	13
International Journal of Information Management	1068	11
Journal of Management Information Systems	2016	10

Table 4 lists the ten most influential journals publishing on technostress. The most influential journal in the field is Computers in Human Behaviour, which has received 4,791 citations. A total of 42 articles have been published in this journal. This indicates that research in this field focuses more on human-computer interaction. A total of 33 academic studies have been published in the International Journal of Environmental

are being studied. It represents a focus on personal perceptions of technology and a greater emphasis on management issues in the field.

Another group is shown in blue. In this group, topics such as stress, impact, satisfaction, performance and burnout are at the forefront. This indicates that the field is more focused on the individual level. The dark side, with keywords such as mental health and job satisfaction, shows that the negative effects of the concept are emphasised. Figure 6 shows the technostress literature along two main axes.

Figure 7

The evolution of trend topics in technostress research (2013–2025)

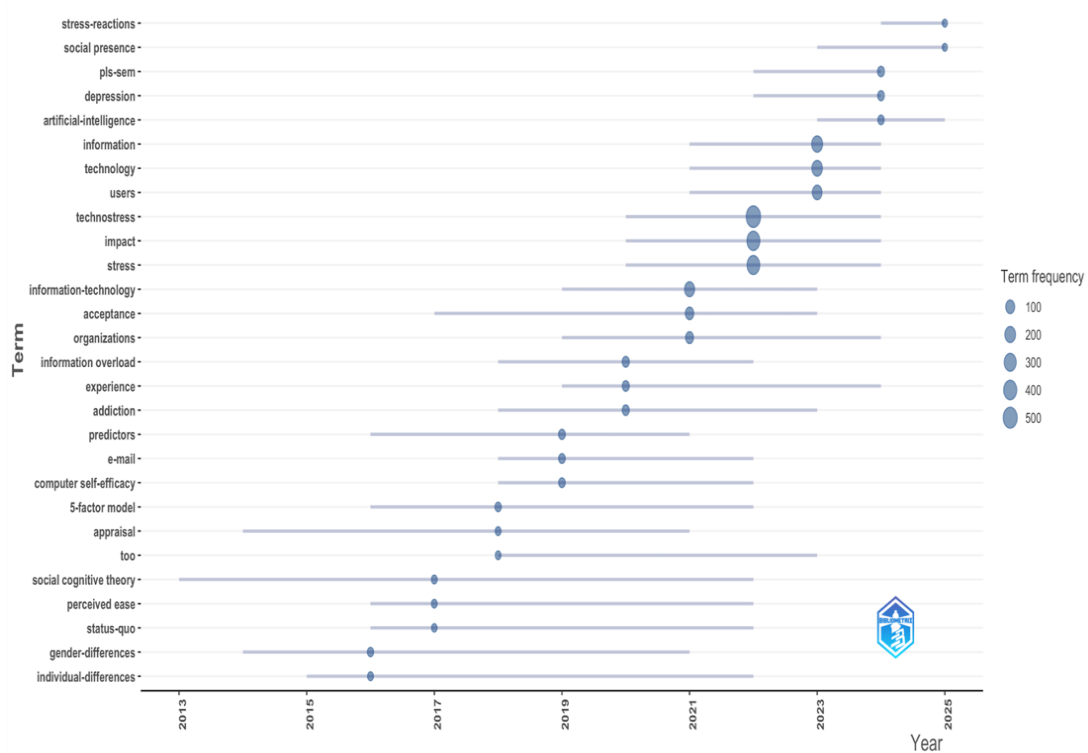


Figure 7 illustrates the path taken by the technostress literature over time and the evolution of the field. Studies between 2013 and 2017 focused more on differences. Gender and personality differences are important topics studied. Social cognitive theory and computer self-efficacy were also studied during the same period. This indicates that theoretical studies predominated in the field during the years mentioned (Ayyagari *et al.*, 2011; Srivastava *et al.*, 2015).

Research between 2018 and 2020 has shifted more towards organisational dimensions. The importance of topics such as information overload, dependency,

acceptance, organisations, and predictors has increased (Califf *et al.*, 2020; Maier *et al.*, 2015). The shift of technostress to the centre of the field and its increased association with technology-based studies points to the post-2020 period. During this period, the concept of technostress was addressed not only in stress-based studies but also in studies using keywords such as technology and information (Tarafdar *et al.*, 2019; Fischer *et al.*, 2023).

The field began to diversify from 2022 onwards. The importance of topics such as artificial intelligence, depression, PLS, SEM, and social presence has started to increase. This indicates that the field has evolved towards methodology and that psychotechnical topics have gained importance (Salanova *et al.*, 2024; Stich *et al.*, 2018). From 2025 onwards, topics such as stress responses and social presence began to show rising trends in the literature. This indicates that the field has begun to be studied more at the organisational level, moving away from the individual dimension (Tarafdar *et al.*, 2019; Califf *et al.*, 2020).

Figure 8

The thematic evolution of technostress research (1982–2025)

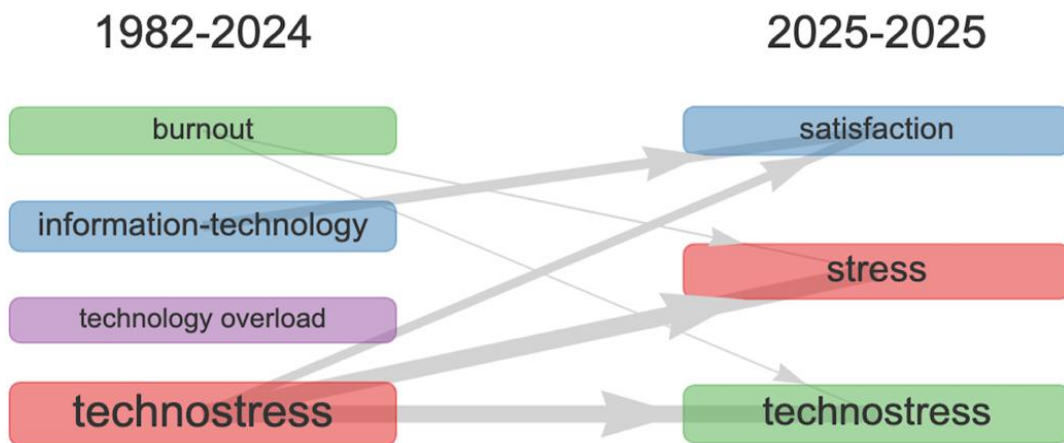


Figure 8 examines the thematic development of technostress research between 1982 and 2025. Studies conducted between 1982 and 2024, referred to as the early period, mainly focused on burnout, information technology, and technology overload (Brod, 1984; Tarafdar *et al.*, 2007; Ayyagari *et al.*, 2011). During this period, negative outcomes such as individual burnout and excessive workload were frequently associated with the concept of technostress (Ragu-Nathan *et al.*, 2008; Maier *et al.*, 2015).

By 2025, a shift in the field's orientation is evident. The concept of satisfaction has gained importance. This indicates that positive outcomes related to technology use have developed in an increasing manner (Tarafdar *et al.*, 2019; Salanova *et al.*, 2024). Furthermore, concepts such as technology overload and burnout have begun to be examined within a broader stress framework (Califf *et al.*, 2020).

Another important point is that the concept of technostress is central to both early studies and studies conducted in 2025. A review of the literature reveals that, unlike early studies, technostress was examined in terms of its potential benefits in the 2025 studies. This indicates that the concept began to undergo a transformation from 2025 onwards. This signifies the emergence of a broader and more holistic perspective on the concept of technostress, encompassing positive outcomes, moving away from a narrow, risk-based view that focused solely on negative consequences.

Figure 9

Intellectual Structure of Technostress Research: An Author Co-Citation Network

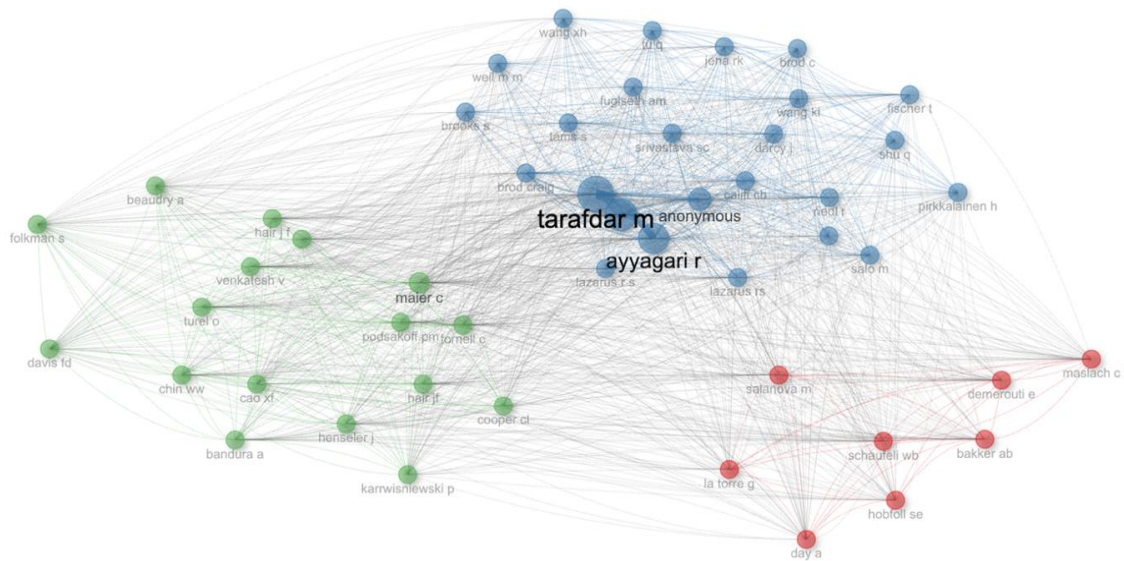


Figure 9 presents the citation networks of different researchers. This visual highlights the authors who cite each other most frequently. In addition, various thematic clusters, shown in different colours, are present in the visual. These thematic clusters have formed due to the existence of studies on similar topics. At the centre of the blue cluster are Tarafdar M. and Ayyagari R. A review of the literature reveals that these researchers focus on the definition of technostress, the sub-dimensions of technostress, and the effects

of information technologies. The studies in this cluster are based on the operational model of stress, which explains stress as an interaction between the individual and the environment (Tarafdar *et al.*, 2007).

Researchers such as Davis, Venkatesh, and Beaudry are at the centre of the green cluster. This cluster reflects the existence of studies examined within the framework of the technology acceptance model. Concepts such as self-efficacy and structural equity modelling feature in many of the studies conducted within this cluster. The red cluster points to studies related to the field of organisational behaviour. Maslach, Demerouti and Salanova are at the centre of the field.

Figure 10

The global country collaboration map in technostress research.

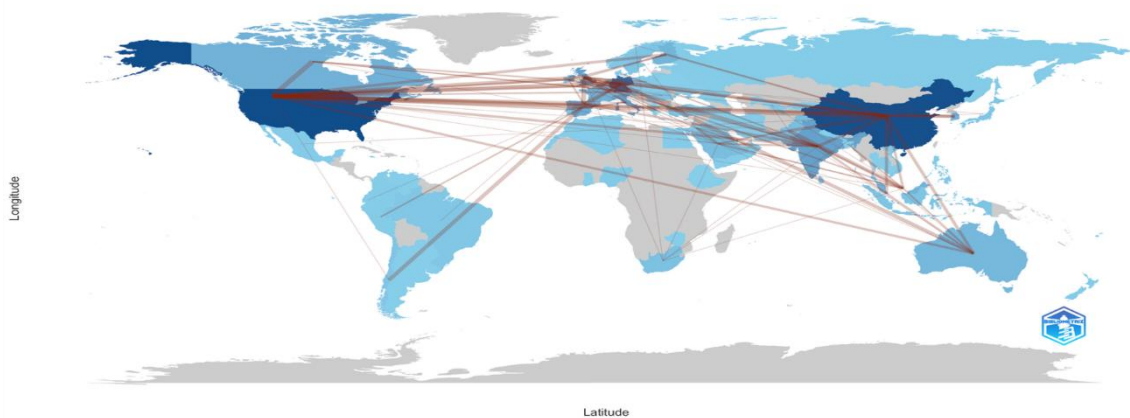


Figure 10 presents the collaborations between different countries in the field of technostress research. Countries shown in dark blue are those that have conducted the most research in the field of technostress and have the most collaborations in this field. Upon examining the figure, it can be seen that the United States, China, and Germany have conducted the most research related to technostress and have collaborated most with other countries. The red lines in the figure indicate the intensity of joint academic publications between countries. From this, it can be seen that European countries collaborate intensively with each other. Similarly, a similar intensity can be seen with North American and Asian countries. Countries such as the United Kingdom, Australia, India, Singapore, and Canada are also actively conducting research in this field. This map shows the international scope of research in this field and the level of increasing global interaction among researchers working in this area. Collaboration at this level will

increase diversity in the field and enable technostress to be studied in different cultures in particular.

4 DISCUSSION

The concept of technostress has been analysed in detail within the scope of organisational behaviour and information systems literature. The analyses revealed that the concept of technostress is a risk factor that must be managed in organisational change processes. The main reason for this is that technostress is a type of individual stress. An examination of the frequently used keywords presented in the analysis section reveals the intensity of organisational change studies. Furthermore, an analysis of the frequent use of keywords together shows that technostress is often studied in conjunction with individual-level outcomes such as burnout and work stress. Another group of keywords frequently associated with technostress are digital transformation, organisational change, and performance issues. Examining the thematic map, it can be observed that the sub-dimensions of technostress, namely techno-invasion, techno-overload, techno-insecurity, and techno-uncertainty, affect all processes within organisations. The conclusion drawn from this is that organisations must act systematically, especially during change processes. Furthermore, as seen in the citation analyses, the concept of technostress is conceptualised as a strategic issue in organisational processes (Tarafdar *et al.*, 2015; Ayyagari *et al.*, 2011). As a result of all these analyses, it has been seen that technostress is a risk factor that must be managed, especially in organisational change processes. The most important reason for this is the critical consequences that the concept produces at the individual level. The most important feature that distinguishes this study from other studies is that the concept has been examined in a unique way. In previous studies, the concept was considered a sub-dimension of stress and a sub-dimension of technology-induced stress. This study examined the period from 1982 to 2025. The reviews attempted to reveal the thematic structure of the field and, as a result, sought to obtain theoretical approaches and collaboration networks. Within this scope, 1,297 academic studies were examined and analysed. The fact that only technostress was addressed in the study ensured that the concepts of technology positive stress (techno-eustress) and technology negative stress (techno-distress) were more clearly defined. These two concepts show that

technostress does not only have negative effects; if managed correctly, it can also produce positive results.

The study presents important findings for both academic literature and working life. The analyses reveal that technostress research converges on three main areas. These areas are: stress theories and information systems; technology acceptance models; and organisational behaviour approaches. The concepts of positive technology stress and negative technology stress, which emphasise the positive and negative consequences of technostress, along with its sub-dimensions such as technodiscomfort, technouncertainty, and technocomplexity, remain at the intersection of these three fundamental areas. This study attempts to reveal the development processes of the field over time and to identify the authors who have contributed to the field and their countries. As a result, the leading names and countries in the field have been analysed.

The analysis revealed that the sub-dimensions of technostress can also be linked to various theories. The concepts of techno-overload and techno-invasion, which are sub-dimensions of technostress, have frequently been addressed together with studies examining stress within the operational model. The review conducted on technostress revealed that the concept is also addressed within the framework of the job demands-resources model. In particular, organisational support systems can be seen as a resource in this context.

5 CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

The concept of technostress has been examined in this study from historical, theoretical and thematic perspectives. This study's contribution to the technostress literature lies here. This contribution will also serve as a roadmap for future studies. This analysis makes it possible to see how studies examining the effects of technostress on the workplace have evolved over time and how they will change in the future. This will particularly provide a source for studies seeking to examine the impact of technostress on the workplace. When looking at studies that examine the emotions and behaviours of employees during digital transformation processes, it will serve as a guide for human resources managers and various organisational managers. This demonstrates that the study not only contributes to the theoretical world but also to the business world.

In addition to all these contributions, there are also some limitations to this study. Firstly, the data presented in this study is limited to academic publications written in English and found in the Web of Science database. The most important reason for examining only English-language studies is to ensure linguistic consistency in the study. This may result in the neglect of studies written in different languages that have made significant contributions to the field. Another limitation is that the content of the studies examined was not examined in depth; instead, the analysis was based on citation data. This situation stems from the nature of bibliometric analysis. By its very nature, bibliometric analysis focuses on citation data rather than the depth of the studies examined. For this reason, future researchers on technostress are advised to conduct reviews of the classical literature in the field. Thematic clusters of technostress were also examined in this study. In this review, the software tools used may overlook contextual details in thematic analyses. The most important reason for this is that these tools operate with predefined parameters. Therefore, our analyses of thematic clustering should be critically examined. The thematic structures obtained in this study should be critically integrated with classical systematic reviews.

This study offers various suggestions for future research. Upon examining the field, it is evident that the concept of technology-induced positive stress is a promising area of study. Research should investigate whether technology-induced positive stress fosters innovative thinking in individuals and whether it contributes to employees' organisational adaptation skills. The positive and negative effects of technostress can be examined in different cultures and different sectors. When examined in terms of workplace processes, as can be seen from the thematic analysis data in this study, it provides information on the design of digital workplace policies and employee-friendly information systems. Despite various limitations in the study, it is considered that this study has made an important contribution to the field by mapping the current state of knowledge on technostress. As a result of the analyses examined, both theoretical researchers and managers in the workplace will be able to define technostress, manage it, and transform it to increase the organisation's efficiency. It will be a supporting element, especially for managers in digital transformation processes, in creating a technological structure that puts the employee at the centre. In addition, it will be a source of information in the development of various organisational support systems. In conclusion, this analysis provides a descriptive and guiding contribution to the existing technostress literature.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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