The Reflections of Technostress on Job Performance: A Meta-Analytical Approach

(Teknostresin İş Performansına Yansımaları: Meta-Analitik Bir Yaklaşım)

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Abstract
The main objective of this study is to comprehensively reveal the effect of technostress, which is becoming increasingly important in today's work environments where the digitization process is accelerating, on job performance. In this context, the meta-analysis method was used in the study, and the findings of nine independent studies conducted in different sectors and cultural contexts were analysed within the scope of a random effects model. Fisher's z-transformed correlation coefficients were used as the effect size measure, and analyses of heterogeneity, publication bias, and reliability were performed. The analysis results showed a negative and statistically significant relationship between technostress and job performance (r=-0.588, p<.05). The results reveal that technostress is not only an individual source of stress in work life but also a critical variable in terms of organizational performance. The findings show that the sustainability of digital transformation is possible not only through technological infrastructure investments but also by strengthening employees' psychological resilience, digital competence, and technological adaptation skills.

ÖZ
Bu araştırmanın temel amacı, dijitalleşme sürecinin hız kazandığı günümüz çalışma ortamlarında giderek önem kazanan teknostres olgusunun, iş performansı üzerindeki etkisini bütüncül biçimde ortaya koymaktır. Bu bağlamda araştırmada meta-analiz yöntemi kullanılmış, farklı sektör ve kültürel bağlamlarda yürütülen dokuz bağımsız çalışmanın bulguları rastgele etkiler modeli kapsamında analiz edilmiştir. Etki büyüklüğü ölçütü olarak Fisher'in z'ye dönüştürülmüş korelasyon katsayıları esas alınmış, heterojenlik, yayın yanlılığı ve güvenilirlik analizleri gerçekleştirilmiştir. Analiz sonuçları, teknostres ile iş performansı arasında negatif yönlü ve istatistiksel olarak anlamlı bir ilişki bulunduğunu göstermiştir (r=-0.588, p<.05). Sonuçlar, teknostresin iş yaşamında yalnızca bireysel bir stres kaynağı değil, örgütsel performans açısından da kritik bir değişken olduğunu ortaya koymaktadır. Bulgular, dijital dönüşümün sürdürülebilirliğinin yalnızca teknolojik altyapı yatırımlarıyla değil, çalışanların psikolojik dayanıklılık, dijital yeterlilik ve teknolojik uyum becerilerinin güçlendirilmesiyle mümkün olacağını göstermektedir.

1. Introduction

In the 21st century, where digitalization can be defined as a key element, information and communication technologies have become an integral part of business processes. This transformation has increased efficiency, flexibility, and innovation in organizations, but it has also led to the emergence of new types of stress sources for employees and paved the way for the concept of "technostress." The concept of technostress was first defined by Brod (1984) as a type of modern stress disorder stemming from individuals' inability to adapt to new technologies. Today, technostress is a widespread phenomenon affecting employees in almost every sector due to the prevalence of technology in all areas of life.

Technostress is fundamentally fuelled by factors such as the rapid development of technological tools, the constant need to be online, information overload, technical complexity, feelings of insecurity, and the blurring of boundaries between work and private life. In the model developed by Tarafdar et al. (2007), these factors were classified as "techno-overload," "techno-invasion," "techno-complexity," "techno-insecurity," and "techno-uncertainty." Numerous studies have shown that these stressors have a decisive impact on employees' psychological well-being, job satisfaction, burnout levels, and ultimately, job performance (Gerdiken et al., 2021; Kızılcan et al., 2023; Yener, 2018). However, recent global research indicates that technostress has critical consequences not only at the individual level but also in terms of organizational efficiency. Indeed, findings suggest that high levels of technostress indirectly reduce performance by increasing burnout (Tu & Rao, 2025; Saleem & Malik, 2023), and findings have also been obtained that technostress reduces job security and negatively affects task performance (Aprilia & Riani, 2023; Kaymaz, 2019). In contrast, some research findings suggest that variables such as appropriate organizational support, flexible work arrangements, and self-efficacy regarding technology can mitigate the negative effects of technostress (Saidy et al., 2022).

Although it has been a concept in the literature for many years, the COVID-19 pandemic has made the phenomenon of technostress even more visible with the widespread adoption of remote and hybrid working models. Research conducted particularly in the education, public, and IT sectors shows that in the post-pandemic period, employees' dependence on digital tools has increased, leading to intensified information overload, distraction, and work-life conflict (Valiao, 2025). According to data from the International Labor Organization (ILO), as of 2023, there has been a significant increase in the levels of technostress among workers worldwide. A report published by the Organisation for Economic Co-operation and Development (OECD) emphasizes that the "excessive/unbalanced" use of digital technologies can have negative effects on individuals' well-being, such as mental health and work-life balance.

There are different perspectives in the literature on the effects of technostress on job performance. On the one hand, it is argued that intensive use of technology causes psychological pressure and loss of productivity among employees. On the other hand, it is argued that with appropriate management strategies, digital competency development programs, and a positive technology culture, technostress can be transformed into "constructive stress," which encourages innovation, creativity, and learning, thereby promoting development (Atrian & Ghobbeh, 2023). This study aims to synthesize the empirical findings in the existing literature to reveal the general direction and magnitude of technostress's effects on job performance. By bringing together findings from different sectors and dynamics, the study is unique in that it integrates the fragmented view in the literature and provides a comprehensive overview of the role of technostress on organizational performance.

2. Conceptual Framework

2.1. Technostress

The rapid integration of information and communication technologies into the workplace has fundamentally transformed the structure of organizations, their processes, and employees' understanding of their roles. While this transformation has increased productivity and innovation, it has also given rise to a new form of stress among employees known as technostress. The concept of technostress was first defined by Craig Brod (1984) as "a modern illness resulting from individuals' inability to adapt healthily to new computer technologies." According to Brod, technological change creates emotional exhaustion, feelings of inadequacy and meaninglessness, and anxiety in individuals, which in turn leads to negative consequences on job performance, motivation, and job satisfaction. In subsequent years, the concept of technostress was addressed more systematically in the disciplines of organizational behavior, information systems, and work psychology. A study pioneered by Tarafdar et al. (2007) developed the "technostress creators" model by placing the concept within a theoretical framework. In this model, technostress is addressed in five key dimensions. These dimensions are techno-overload, techno-invasion (boundary violation and work-life intrusion), techno-complexity (complexity and learning difficulty), techno-insecurity (job security anxiety), and techno-uncertainty (constant change and uncertainty). These dimensions determine stress levels based on the individual's degree of exposure to technology, organizational expectations, and personal competence perception (Tarafdar et al., 2007).

The importance of technostress for organizations and employees is increasingly growing. Especially during digital transformation processes, employees are expected to be constantly online, quickly learn new systems, and perform at a high level. This situation leads to technology becoming both a facilitating and a pressuring factor for individuals (Atrian & Ghobbeh, 2023). Research shows that technostress reduces individuals' psychological well-being, job satisfaction, and organizational commitment, while increasing burnout and absenteeism (Pflügner et al., 2024).

Studies list the possible causes of technostress as follows:

• Exposure to an intense flow of information: Due to the numerous sources providing information to employees, stress is experienced as a result of the inability to acquire, respond to, and control this information (Ayyagari et al., 2011).

• Communication pressure: The increase in the use of tablets, computers, and the internet has led to an increase in the demands of authorities to be in constant communication with employees and the expectation that employees respond to these demands without interruption (Nimrod, 2018).

• Lack of quality: increased workload due to technological change, software and hardware security risks, feeling of not having technological competence (Ennis, 2005).

Factors affecting technostress can be examined at three levels: individual, organizational, and environmental. Individual factors include variables such as attitudes toward technology, self-efficacy, age, gender, and cognitive capacity. In particular, individuals with high self-efficacy perceive technological innovations as opportunities rather than threats and experience lower stress levels (Saidy et al., 2022). Organizational factors include supportive leadership, open communication, flexible work policies, and adequate training programs. A supportive organizational climate reduces the effect of technological demands on perceived stress (Aprilia and Riani, 2023). Environmental factors stem from external pressures such as pandemics, economic fluctuations, or digitalization policies. Indeed, the COVID-19 pandemic has been a turning point in which technostress has become widespread on a global scale, along with remote work and constant digital interaction (Valiao, 2025).

Recent studies suggest that technostress does not only produce negative outcomes; under appropriate conditions, it can also increase employees' motivation to solve problems, learn, and innovate in the form

of "constructive stress" (eustress) (Wang & Beh, 2025; Saidy et al., 2022). This situation is related to technological demands being perceived as an opportunity for development rather than a threat. Therefore, it should be stated that technostress is a dynamic phenomenon shaped by the interaction between individuals' cognitive and emotional resources and organizational support systems.

2.2. Job Performance

Performance generally refers to the level of success achieved as a result of activities carried out by individuals or organizations to achieve specific goals. Derived from the Latin word performare (to carry out, to shape), this concept corresponds to both a process and a result. In other words, performance encompasses not only the degree to which an individual fulfills their duties, but also how they manage this process, how effectively they use their resources, and their problem-solving skills (Emhan et al., 2013). In this sense, performance is a multidimensional phenomenon shaped by the interaction between individual qualities and environmental conditions (Armstrong, 2014). Indeed, performance is a dynamic process shaped by the continuous interaction of individual characteristics, organizational systems, and environmental conditions, rather than a static output.

Job performance is one of the fundamental concepts used in organizational psychology and management science to evaluate employee behavior. In its broadest sense, the concept is defined by Campbell (1990) as the level at which an employee performs the activities outlined in their job description within a specific period and the degree to which these activities contribute to organizational goals. Job performance is not only an indicator of quantitative outputs but also of behavioral qualities such as an individual's sense of responsibility, creativity, cooperation, and adaptability. Therefore, the concept of performance has evolved beyond being a mere measure of productivity and has become one of the most critical determinants of organizational effectiveness and sustainable competitive advantage (Çelik & Çıra, 2013).

Conceptually, job performance is examined under two main components: task performance and contextual performance. Task performance relates to the employee's ability to effectively carry out their primary duties and is evaluated using criteria such as production quantity, error-free work, and timely delivery. Contextual performance, on the other hand, encompasses behaviors that support the organizational environment and include aspects such as helpfulness, cooperation, and voluntary responsibility (Uysal, 2024). This dual structure indicates that performance cannot be reduced to individual productivity alone, but that social and emotional factors are also decisive.

Job performance determines organizational-level efficiency, profitability, and competitive advantage, while at the individual level, it is closely related to self-efficacy, motivation, and psychological well-being (Çankır et al., 2024). In this regard, it would be appropriate to state that employees need not only technical skills but also resources such as emotional resilience and organizational support to perform at a high level. Indeed, according to Judge and Church (2000), the factors affecting job performance range widely, including individual characteristics (personality, self-efficacy, stress tolerance), the nature of the job (workload, role ambiguity), leadership style, organizational climate, reward system, and especially technological factors.

2.3. Relationship between Technostress and Job Performance

Technostress, which arises from the constant use of technological tools, is a type of stress stemming from the difficulties individuals experience in adapting to technology, the obligation to be constantly connected, and the feeling of being unable to control the flow of information (Brod, 1984). Technostress is considered an important factor that affects job satisfaction, motivation, and ultimately job performance by consuming an individual's physical and mental resources. The relationship between technostress and job performance is generally explained by a negative dynamic. According to the Technostress Creators Model developed by Tarafdar et al. (2007), stressors such as techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty increase employees' role

ambiguity and workload perception, negatively affecting both task performance and contextual performance. Techno-overload (information and task overload) and techno-invasion (pressure of constant availability) in particular reduce the individual's attention span, leading to cognitive fatigue and burnout. This process directly weakens the core components of performance: focus, decision-making, and productivity (Ayyagari et al., 2011).

Theoretically, this relationship is explained within the framework of the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) and the Job Demands-Resources Model (Demerouti et al., 2001). According to the transactional model of stress, when an individual perceives a situation as a source of stress, this perception depends on their cognitive assessment and the adequacy of their coping resources. When technological demands exceed an individual's coping capacity, negative stress occurs, and this situation significantly reduces job performance. The Job Demands-Resources Model argues that technological demands (high tempo, constant connectivity, software changes, etc.) cause burnout by increasing workload, while resources such as social support, training, and autonomy can mitigate these negative effects (Saleem & Malik, 2023). Empirical findings also support these theoretical predictions. Indeed, a meta-analysis study by Gerdiken et al. (2021), which examined numerous empirical studies, found that technostress has a significant negative correlation with job performance. Similarly, Aprilia and Riani (2023) found in their study of public sector employees that technostress indirectly negatively affects task and contextual performance by increasing burnout levels. Another study conducted on education workers yielded similar results. In a study by Tu and Rao (2025), it was determined that technostress has negative effects on job satisfaction and performance among STEM teachers through burnout.

Although the literature presents a picture that focuses on the negative effects of technostress on job performance, it also suggests that technostress does not always have negative consequences on job performance. Indeed, Saidy et al. (2022) noted that employees with high self-efficacy levels can perceive technological demands as a "challenge" rather than a "threat," which can lead to stress transforming into a constructive form and an increase in proactive job behaviors. Similarly, Wang et al. (2025) found that technostress caused by social media can, in some cases, increase individuals' productivity and innovative behavior, but that this depends on the organization's capacity to create a supportive climate.

Based on the literature and theoretical approaches, it is clear that the relationship between technostress and job performance is multidimensional and context-sensitive. At this point, it can be stated that high levels of technostress can reduce productivity by distracting employees, but that this negative effect can be mitigated with appropriate organizational support and individual coping resources; moreover, in some cases, technostress can increase job performance.

3. Method

The study employed meta-analysis as its methodology. Meta-analysis can be defined as an analytical method that systematically combines findings from independent studies on a specific topic to obtain statistically comprehensive and generalizable results (Borenstein et al., 2021). Through this method, data obtained from similar studies can be evaluated comparatively, and trends, orientations, and general conclusions regarding the concept or phenomenon under investigation can be presented from a comprehensive perspective. In this way, meta-analysis combines the limited findings obtained from individual studies, enabling stronger and more reliable scientific conclusions to be drawn on the subject. Since the meta-analysis method utilizes data from previously conducted studies, i.e., secondary data, it does not require ethical committee approval.

In this study, 69 studies addressing the concepts of technostress and job performance together were identified between September 7, 2025, and November 4, 2025, in Google Scholar, Web of Science, Scopus, ProQuest, and EBSCO databases. After removing duplicate studies (25) from the identified studies, the research was conducted with 44 studies. Only 9 studies that quantitatively examined the

relationship between technostress and job performance, reported statistical results allowing the calculation of correlation coefficients or effect sizes, and were available in full-text form were deemed suitable for inclusion in the meta-analysis, and these studies were subsequently carried forward to the analysis phase (Atrian & Ghobbeh, 2023; Baek et al., 2024; Bondanini et al., 2024; Jaiswal et al., 2023; Saleem et al., 2021; Saleem & Malik, 2023; Suharti & Susmoto, 2014; Yalçın et al., 2022; Zhang et al., 2025). The studies included in the research were statistically examined using the Major add-on of the Jamovi statistical program. The correlation coefficients of the studies and the sample sizes of the research were used as the primary data source in the analysis. When interpreting effect sizes, correlation values of 0.50 and above were considered "high effect," correlation values between 0.30 and 0.49 were considered "medium effect," and correlation values between 0.10 and 0.29 were considered "weak effect" (Cohen et al., 2007).

Table 1 below provides general information regarding the studies included in the research, including sample characteristics, research methods, and findings.

Table 1. Research included in the study

Atrian & Ghobbeh (2023)	The research employed a mixed-methods approach (quantitative and qualitative), with data collected through both surveys and in-depth interviews. In the quantitative section, data from 247 employees were obtained and analyzed using SPSS. In the qualitative section, employees' views on their experiences with technostress were analyzed thematically.	The study found a strong and negative relationship between technostress and job performance (r=-0.940, p<0.001). According to the sub-dimension analyses, all technostress factors (technological uncertainty r= -0.860; technological insecurity r= -0.890; technological complexity r= -0.913; technology invasion r= -0.838; technology-induced overload r=-0.882) significantly negatively affected job performance. The findings indicate that technological complexity is the dimension with the strongest negative impact on performance.
Baek et al. (2024)	The research was conducted using quantitative methods, adopting a descriptive cross-sectional design. Data were collected via an online survey and analyzed using SPSS 24 software. The study was conducted on 188 nurses working at three hospitals in South Korea.	The study revealed a significant negative relationship (r=–0.17, p=0.016) between technostress and nursing job performance. In particular, it was determined that the sub-dimensions of technological complexity (β= 0.20, p=0.001) and technological overload (β=–0.15, p=0.007) negatively affected job performance. Within the context of the findings, it was determined that technostress, particularly the complexity and overload dimensions, reduces job performance, while nursing IT competence and information sharing behaviors increase performance. The study emphasizes the need to strengthen nurses' IT competence and reduce technostress during the digital transformation process.
Bondanini et al. (2024)	The research was conducted using quantitative research methods. The survey technique was used as the data collection tool and was carried out on 1,185 employees working in different branches of a multinational company operating in Italy. The analyses were performed using SPSS (PROCESS Macro Model 6).	Research results indicate a negative and significant relationship (r = -0.230, p < 0.001) between technostress and job performance. Furthermore, it has been determined that digital engagement enhances performance through job commitment but reduces it through technostress.
Jaiswal et al. (2023)	The research was conducted using quantitative research methods. Data were collected through a survey technique and analyzed using SEM. The research model was based on a moderated mediation model that included mediating and moderating effects. The study was conducted on 511 teleworkers in the Indian service sector.	The study shows a negative and significant relationship between technostress and job performance (r= -0.180, p<0.001). The research findings indicate a positive and significant relationship between trust in management and employee performance (r= 0.59, p<0.01). Furthermore, the psychological well-being variable has been confirmed as a partially mediating variable in this relationship (r= 0.49, p<0.01). However, technostress has shown a moderating effect on this relationship (r= -0.19, p<0.01). In other words, as the level of technostress increases, the trust-performance relationship weakens. According to the results of the moderated mediation analysis, the trust-well-being-performance relationship was strong when technostress was low and weak when it was high (r= -0.49, p<0.001). The study revealed that the effect of trust on employee performance in the context of teleworking occurs through psychological well-being, but technostress weakens this relationship.

Saleem and Malik (2023)	The research was conducted using quantitative methods. Data were collected via an online survey form and analyzed using SEM with the Hayes PROCESS Macro. The research sample consisted of 199 academics working at public and private universities in Pakistan.	The study found that technostress has a direct positive effect ($\beta=0.203$, $p<0.01$) and a positive, significant relationship ($r=-0.174$, $p<0.001$) with academic' performance, but an indirect negative effect through quality of life. The sub-dimensions of technostress (technological complexity, intrusion, overload) negatively affected academics' quality of life, while showing a direct positive effect on job performance (TC→EP $\beta=0.439$; TO→EP $\beta=0.396$; TI→EP $\beta=0.189$, $p<0.01$). Furthermore, organizational flexibility was identified as an important moderating variable; in situations of low flexibility, the negative relationship between technostress and quality of life was strengthened, while at high flexibility levels, this relationship became insignificant ($\beta=0.176$, $p<0.001$). This finding is important as it indicates that flexible organizations can mitigate the negative effects of technostress.
Saleem et al. (2021)	The research was conducted using quantitative research methods. Data were collected through a closed-ended questionnaire, and stepwise regression analysis and Hayes (2013) PROCESS Macro (Models 1 and 2) were used in the analyses. The study sample consisted of 222 academics working at public and private universities in Pakistan.	The research results showed that, contrary to expectations, there was a positive and significant relationship between technostress and job performance ($r=0.380$, $p<0.01$). In addition, it was found that the variables of education and creative self-efficacy had a moderating effect on this relationship. The positive relationship between technostress and performance was even stronger among employees with high levels of education and creative self-efficacy. In the three-way interaction analysis (PROCESS Model 2), the technostress-performance relationship became significantly more positive at high levels of education and high levels of creative self-efficacy. The study revealed that during the COVID-19 period, when academics viewed technology as an "opportunity" rather than a "threat," technostress could serve as "constructive stress."
Suharti & Susmoto (2014)	The research was conducted using quantitative methods, and data were collected through surveys and interviews. Structural Equation Modeling was used in the analyses. The study was conducted on 138 employees working in the engineering department of a multinational food production company in Indonesia.	According to the research results, a positive and significant relationship was found between workload and technostress ($r=0.415$, $p=0.002$), while a negative and significant relationship was found between technological competence and technostress ($r=-0.454$, $p=0.001$). A strong, negative, and significant relationship was found between technostress and employee performance ($r=-0.940$, $p=0.001$). The findings indicate that high workload and low technological competence increase technostress, which in turn reduces employee performance.
Yalçın et al. (2022)	The research was conducted using quantitative methods, and the survey technique was used as the data collection tool. The relationships were tested using correlation and regression analyses with data obtained from 234 teachers in Türkiye. Hayes' (2004) bootstrap test was applied to determine the mediating effect.	The findings indicate that technostress negatively affects job performance ($r=-0.834$, $p<0.01$) and that organizational cynicism plays a partial mediating role in the relationship between technostress and job performance. Furthermore, it was determined that technostress significantly increases organizational cynicism ($r=0.762$, $p<0.01$) and that organizational cynicism also reduces job performance ($r=-0.692$, $p<0.01$). According to the bootstrap test results, the indirect effect was found to be negative and significant ($a_1 \times b_1 = -0.1761$, $p=0.0153$).
Zhang et al. (2025)	The research was conducted using quantitative methods and survey techniques. Data was collected from 459 miners working in coal mines in China. Analyses were performed using structural equation modeling.	The study revealed a complex dual relationship between technostress and perceived security performance. According to the findings, technostress has both coercive and inhibitory effects. A positive and significant correlation ($r=0.389$, $p<0.01$) was found between technostress and safety performance. It was determined that technostress can have both enhancing and reducing effects on employee performance, depending on individual emotion regulation strategies.

4. Findings

The findings obtained within the scope of the meta-analysis reveal general trends, statistical significance levels, and subgroup differences regarding the relationship between technostress and job performance. The analysis results show that there are significant differences in the studies in terms of the direction and intensity of this relationship. The findings of the nine different studies included in this study were combined using meta-analysis methods to calculate the average effect size. During the analysis process, a random effects model was applied to account for possible differences between the data. Data

heterogeneity (τ^2) was calculated using the restricted maximum likelihood (REML) estimation method (Viechtbauer, 2010). Furthermore, Cochran's Q test (Cochran, 1954) and the I^2 statistic were evaluated to determine the level of heterogeneity, and the results were reported. If any level of heterogeneity was detected (when $\tau^2 > 0$, regardless of the Q test result), the true effect estimate range for the findings was also calculated. Furthermore, Studentized residuals and Cook's distance values were analysed to examine the effects of the studies on the model and possible outlier situations. Studies with residual values greater than the $100 \times (10.05/(2 \times k))$ percentile of the standard normal distribution were considered potential outliers.

According to the results of the heterogeneity test examining the variance among the studies included in this research, a high level of heterogeneity was detected ($Q(8)=1226.2477$, $p<0.0001$, $tau^2=0.6187$, $I^2=99.5284\%$). This indicates that certain variables, such as sample size, sector, measurement tools, and cultural factors, differentiate the effect sizes among the studies examined. The data obtained from the heterogeneity test are presented in Table 2 below.

Table 2. Heterogeneity test statistic

Tau	Tau²	I²	H²	R²	df	Q	p
0.786	0.6187 (SE= 0.3113)	99.53%	212.036	.	8.000	1226.248	< .001

In meta-analysis studies, Fisher's r-to-z transformed correlation coefficients are used to establish a common effect size measure among the studies included in the analysis. The correlation coefficient (r) is a fundamental statistic that indicates the direction and strength of the relationship between two variables; however, its distribution is not symmetrical across different sample sizes, and its direct inclusion in meta-analysis can lead to biased results. Therefore, the z-transformation developed by Fisher (1921) is applied to stabilize the variance of the correlation coefficient and approximate its distribution to normal. The obtained z-values were used in the meta-analysis process to calculate the weighted average effect sizes and were then converted back to correlation coefficients (r) after the analysis was completed to facilitate interpretation. The regression test data, which is the estimator of the standard error of the results observed with the rank correlation test, is presented in the funnel plot in Figure 1.
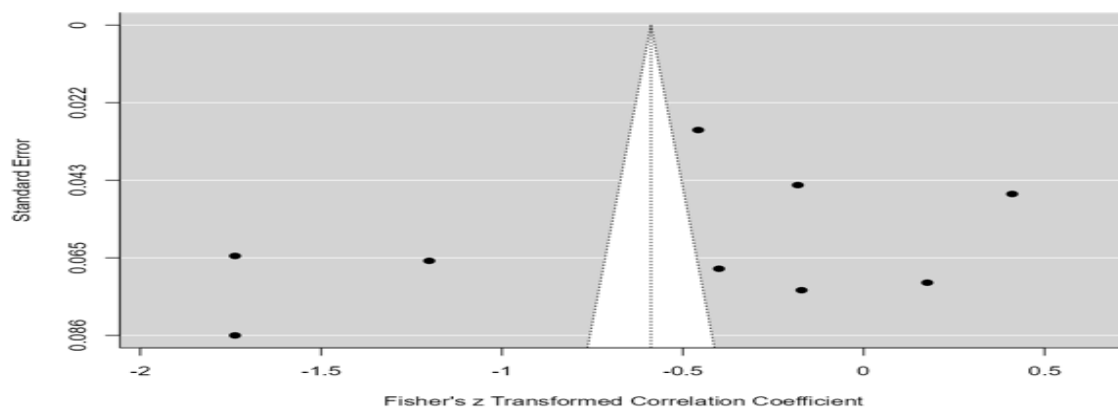

Figure 1. Funnel Plot

Figure 1 shows Fisher's z-transformed correlation coefficients on the horizontal axis and standard error values on the vertical axis. The funnel plot illustrates the distribution of effect sizes of studies included in the meta-analysis according to sample size and indicates the absence of publication bias when the distribution is symmetrical. In this regard, when the distribution shown in the graph is examined, it is

seen that the studies are relatively evenly distributed around the center of the funnel shape, and therefore, no significant asymmetry is observed. This suggests that the effect sizes obtained from the studies do not show a systematic bias, i.e., there is no tendency to report only significant results.

A total of 9 (k=9) studies were included in the analysis process. The Fisher r-to-z converted correlation coefficients observed range from -1.738 to 0.410. The mean of the Fisher r-to-z converted correlation coefficients estimated in the context of the random effects model was found to be -0.588. Detailed information regarding the correlation is presented in Table 3.

Table 3. The relationship between technostress and job performance

	Estimate	**se**	**Z**	**p**	**CI Lower Bound**	**CI Upper Bound**
Intercept	-0.588	0.263	-2.24	< .025	-1.104	-0.073

The findings in Table 3 indicate that the relationship between technostress and job performance is negative and statistically significant (β= -0.588, SE=0.263, z= -2.24, p<.025). These values reveal that an increase in technostress significantly reduces employees' job performance. Furthermore, the calculated 95% confidence interval (-1.104 to -0.073) does not include zero, confirming that the relationship is reliable and statistically robust. This finding supports the notion that the cognitive and emotional strain experienced by employees as technological demands increase negatively impacts their effectiveness in work processes. In other words, increased technological pressure weakens employees' ability to perform their tasks efficiently.

Due to the detection of heterogeneity in the data as a result of the analyses, a random effects model was used in the meta-analysis conducted in this study (Higgins & Thompson, 2002). The forest plot obtained in the context of the analysis is shown in Figure 2.
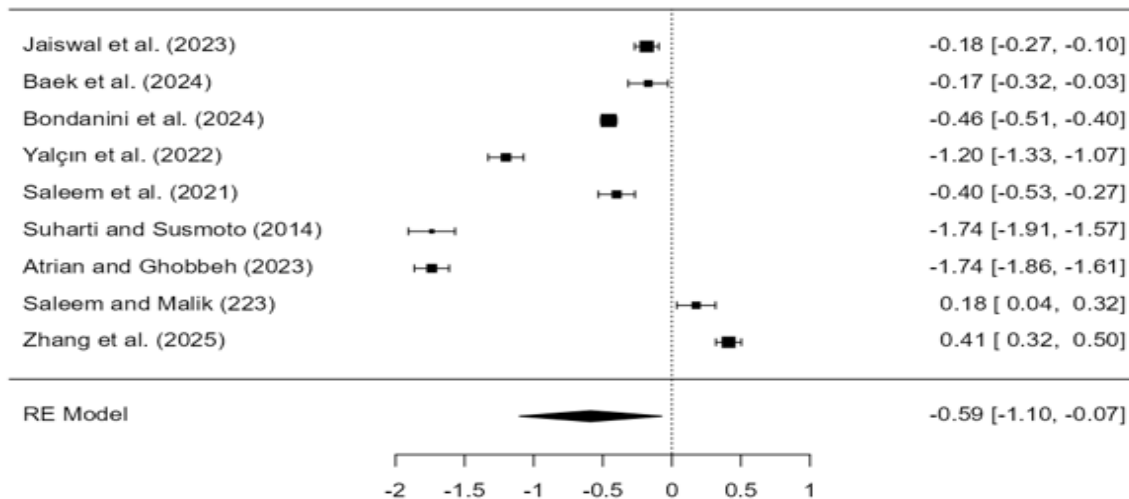

Figure 2. Forest Plot

Figure 2 presents a forest plot showing the effect sizes and confidence intervals for the relationship between technostress and job performance from the nine independent studies included in the meta-analysis. Each horizontal line in the plot corresponds to the effect size and 95% confidence interval of the respective study. The size of the squares represents the weight of the study (sample size), while the diamond shape at the bottom shows the pooled (average) effect size obtained according to the random effects model. As seen in Figure 2, seven of the studies found a negative relationship between technostress and job performance. This indicates that technological pressure, excessive information load, and complex systems reduce employee performance. In contrast, two studies found a positive

relationship. This finding suggests that, in certain contexts, technostress can become "constructive stress" and motivate employees.

Although there was some heterogeneity in the study, no outliers were found since none of the values exceeded ±2.772. According to the Fail-Safe N value, which is the output of the analysis conducted on publication bias, it was determined that publication bias could occur if 2,512 more works were included in the study. However, due to the Begg and Mazumdar Rank Correlation value being (-0.056, p=0.419), it was observed that there was no publication bias in the research. The reliability values provided regarding the bias and accuracy of the analysis are accepted within the desired limits. The publication bias results are presented in Table 4.

Table 4. Publication bias test results.

Test	value	p
Fail-Safe N	2512.000	< .001
Begg and Mazumdar Rank Correlation	-0.056	0.419
Egger's Regression	-1.194	0.232
Trim and Fill Number of Studies	0.000	.

The meta-analysis revealed a significant negative correlation between technostress and job performance at a level of -0.59, which is considered high (Cohen et al., 2007). This finding indicates that technostress is a significant factor negatively affecting employees' job performance. This result integrates the findings of studies in the literature that examine similar concepts, revealing a general trend regarding the effect of technological stress on performance. Accordingly, in the results section, the studies included in the meta-analysis will be comprehensively addressed, and the effects of different dimensions of technostress (technological complexity, overload, etc.) on performance will be evaluated.

5. Discussion and Conclusion

With digitalization permeating all aspects of work life, employees' interaction with technology has evolved beyond being merely a factor that increases productivity; it has also become an important area of research in organizational behavior, psychology, and management literature. At this point, technostress stands out as a type of stress unique to today's world, experienced by individuals at cognitive, emotional, and behavioral levels as an inevitable consequence of modern working life. This meta-analysis study aims to synthesize the findings of empirical studies conducted in different geographical, sectoral, and methodological contexts quantitatively, thereby integrating the scattered evidence in the literature regarding the impact of technostress on job performance. This approach clarifies the direction and intensity of the technostress-performance relationship at a theoretical level and emphasizes the strategic importance of the human factor in organizations' digital transformation processes.

The findings of this study, based on nine independent studies in the literature, generally show a negative and statistically significant relationship between technostress and job performance (β=–0.588, p<.025). This result reveals that the increase in technological demands causes cognitive and emotional overload in employees, thereby reducing task effectiveness and negatively affecting performance levels.

The result obtained from the study is consistent with many empirical findings in the literature. Indeed, studies conducted by Suharti and Susmoto (2014), Atrian and Ghobbeh (2023), and Yalçın et al. (2022) also determined that technostress significantly reduces job performance. These studies reveal that technological complexity, constant connectivity pressure, and information overload weaken employees' ability to focus, make decisions, and generate innovation. Similarly, Tu and Rao (2025) found that

technostress indirectly leads to performance loss by increasing burnout. When evaluated within the framework of the Operational Model of Stress (Lazarus & Folkman, 1984) and the Job Demands-Resources Model (Demerouti et al., 2001), these findings confirm that negative stress responses occur when technological demands exceed an individual's coping resources, resulting in decreased performance.

However, some studies included in the meta-analysis also show that technostress does not always lead to negative outcomes. In this regard, studies conducted by Saleem et al. (2021) and Saleem and Malik (2023) indicate that technostress can function as "constructive stress" under certain conditions and motivate employees to solve problems, learn, and innovate. This suggests that variables such as self-efficacy, organizational flexibility, and supportive leadership can counterbalance the negative effects of technostress. Indeed, the study by Saidy et al. (2022) emphasized that individuals with high self-efficacy can perceive technological demands as challenges rather than threats, thereby mitigating the negative impact of stress on performance. Therefore, the effect of technostress is context-sensitive; moreover, individual characteristics, organizational support level, and technological competence can determine the direction of this relationship.

According to the meta-analysis results, a high level of heterogeneity (I^2=99.53%) was found among the studies. This finding stems from the fact that the studies were conducted in different cultural, sectoral, and methodological contexts. This diversity limits the generalizability of the results on the one hand, while pointing to the multidimensional nature of technostress on the other. Indeed, while the pressure brought about by technological intensity directly leads to performance loss in some sectors (education, health), in areas such as information technology, technostress is seen to create a more complex dynamic alongside learning motivation and innovation (Bondanini et al., 2024; Wang & Beh, 2025). Furthermore, publication bias test results (Fail-Safe N= 512; Begg p=0.419; Egger p= .232) indicate that the study is highly reliable. The symmetry observed in the funnel plot confirms that there is no systematic tendency toward reporting significant results in the studies included in the meta-analysis. This reinforces the statistical integrity of the study and the scientific validity of the results.

This study has revealed that the effect of technostress on job performance is generally negative and significant, but the intensity of this effect may vary depending on individual and organizational conditions. The findings indicate that it is not sufficient for organizations to invest only in technological infrastructure during their digitalization processes; they must also develop their employees' digital competencies, strengthen their psychological resilience, and establish technological stress management strategies. In addition

This study attempts to contribute to the technostress literature at the quantitative synthesis level, aiming to establish a theoretical and practical reference point for future research. It is anticipated that subsequent studies examining technostress in greater detail within the framework of cultural dynamics, leadership styles, and digital business models will strengthen the concept's position in the organizational behavior literature.

Author Contributions

All authors contributed equally to all parts of the study.

Conflict of Interest Statement

The author declares that there is no conflict of interest.

Ethical Approval Statement

Academic and scientific ethical principles were followed in this study. Ethical committee approval was not required.

Use of Artificial Intelligence Tools

The author(s) did not use any artificial intelligence tools during the preparation of this study.

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