Burnout in Digital Era: The Role of ICT Demands, ICT Resources, and Digital Overload in Public Sector

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Article Info	Abstract
	The increasing integration of digital technologies in public sector work has transformed how employees interact, access information, and perform tasks. While this digital transformation offers efficiency and flexibility, it also introduces new forms of work-related pressure, such as information overload, frequent interruptions, and the need for constant availability. Based on the principles of the Job Demands-Resources (JD-R) model, these factors are categorized as ICT demands and ICT resources. This study aims to examine how ICT demands and ICT resources influence employee burnout, while also exploring the mediating role of digital overload in this relationship. A cross-sectional survey was conducted involving 358 civil servants in Indonesia's public education sector. Data were collected using a structured questionnaire and analyzed through structural equation modeling. The sampling technique employed was non-probability sampling using a purposive sampling method. The results indicate that ICT demands significantly increase both digital overload and burnout, whereas ICT resources are associated with a notable reduction in these outcomes. Additionally, digital overload serves as a partial mediator in the links between ICT demands and burnout, as well as between ICT resources and burnout. These findings illustrate the dual nature of digital technologies in influencing employee well-being: while excessive ICT-related pressures contribute to strain and exhaustion, sufficient ICT support can mitigate these effects. This underscores the need for public sector institutions to align digital workload expectations with adequate support systems in order to cultivate a healthier and more sustainable work environment.

INTRODUCTION

Technological advancements in digital communication and information systems have brought substantial changes to work processes across many fields, including governmental institutions. Indonesia has been advancing its digital transformation agenda through a digital governance initiative known in Indonesia as SPBE (*Sistem Pemerintahan Berbasis Elektronik*), which has helped position the country among the top 70 in the United Nations' 2024 e-Government Development Index. The Ministry of Primary and Secondary Education (*Kementerian Pendidikan Dasar dan Menengah*/Kemendikdasmen), has demonstrated progressive digitalization, achieving an SPBE index score of 4.02 in 2024, categorized as "excellent." According to the Ministry's Center for Data and Information Technology, approximately 550 digital platforms (applications and websites) have been developed to support internal and external services.

A survey conducted by the researcher between January 20 and 24, 2025, involving 67 civil servants from the Bureau of Organization and Human Resources, the Directorate of Primary

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Education Teachers, the Directorate of Teacher Professional Education, and the Directorate of Primary Schools at Kemendikdasmen, revealed that employees use, on average, approximately ten different digital applications, with one employee using up to twenty. This finding underscores the growing digital workload faced by employees, along with the potential psychological strain and job fatigue arising from systemic multitasking and frequent digital interruptions (Abdulkareem et al., 2024; Fleischer & Wanckel, 2023; Ninaus et al., 2021).

These challenges are categorized as ICT demands, which include pressures of constant connectivity, fragmented workflows, and information overload (Ninaus et al., 2021). These demands have been consistently linked to burnout symptoms in various organizational settings (Hwang et al., 2020; Ninaus et al., 2021). In contrast, the Job Demands-Resources (JD-R) model also conceptualizes ICT resources, such as autonomy-enhancing technologies and supportive digital tools, as potential buffers against burnout (Ninaus et al., 2021; Ruiner et al., 2023).

Nevertheless, most existing studies have focused on the negative impacts of ICT use, such as ICT demands, digital overload, stress, and burnout, while giving limited attention to the potential protective role of ICT resources. For instance, Abdulkareem et al. (2024) examined ICT use, digital overload, job autonomy, and job satisfaction; Abu Farha et al. (2022) analyzed ICT demands, burnout, and job satisfaction; and Fleischer & Wanckel (2023) focused on digital overload, job autonomy, and job satisfaction. However, most of these studies emphasized risk factors, with ICT resources often treated as secondary or yielding inconclusive effects. This creates a conceptual gap in understanding the dual role of ICT, both as a demand and as a potential resource, in shaping employee well-being. Notably, research by Ninaus et al. (2021) found that ICT resources did not significantly reduce burnout, highlighting a theoretical inconsistency that calls for further investigation, especially in post-pandemic and developing-country contexts.

While prior research has explored ICT-related stress primarily in Western, private-sector environments, empirical studies focusing on public institutions remain limited. For instance, Ninaus et al. (2021) conducted their study on employees in Austria, Fleischer & Wanckel (2023) examined public sector employees in Germany, Italy, and Norway, Nuutinen and Bordi (2024) focused on teachers in Finland, and Ruiner et al. (2023) studied workers in German production and logistics organizations. These studies predominantly reflect the context of advanced economies, which may differ significantly from public institutions in developing countries in terms of bureaucratic structure, work culture, and resource constraints.

In the Indonesian context specifically, rigid bureaucratic hierarchies and unequal access to digital infrastructure may intensify the impact of ICT demands while simultaneously constraining the effectiveness of ICT resources. These contextual factors could potentially alter the nature and strength of the relationships among the variables studied. Therefore, this study aims to address these contextual and theoretical gaps by examining how ICT demands and ICT resources influence burnout among civil servants in The Ministry of Primary and Secondary Education of Indonesia, with digital overload as a potential mediator.

Accordingly, the objectives of this study are: (1) to investigate the extent to which ICT demands and ICT resources influence digital overload and burnout among public sector employees in The Ministry of Primary and Secondary Education of Indonesia, and (2) to examine whether digital overload mediates the relationship between ICT demands/resources and burnout. This approach enhances our understanding of ICT's dual impact on employee outcomes and provides valuable insights for shaping digital governance policies that support a healthier and more sustainable work environment in the public sector.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The Model of Job Demands–Resources (JD-R)

The Job Demands–Resources (JD-R) model, first introduced by Demerouti et al. (2001), is widely recognized as a key theoretical framework for analyzing the impact of different job factors on employee performance and mental well-being. This framework distinguishes two core components of the workplace: job demands, defined as the physical or mental efforts required by work tasks, and job resources, which support goal attainment, reduce the strain caused by demands, or foster employee growth (Demerouti et al., 2001). Although job demands like heavy workload, emotional

stress, and time constraints can contribute to strain and burnout, job resources including autonomy, feedback, and social support play a crucial role in boosting engagement and motivation (Demerouti et al., 2001). The JD-R model functions through two main pathways: the health deterioration process and the motivation-enhancing process (Bakker & Demerouti, 2007). The health impairment process describes how overwhelming job demands drain an individual's mental and physical energy, which can cause stress, fatigue, and eventually burnout. On the other hand, the motivational process proposes that job resources enhance intrinsic motivation by satisfying psychological needs (Deci, 2017), leading to greater work engagement and better performance. Additionally, job resources serve as protective factors that lessen the harmful impact of high job demands on employees' well-being. When sufficient resources like autonomy, support, and feedback are available, they can notably decrease the likelihood of burnout caused by demanding work conditions (Bakker et al., 2005).

ICT Demands

As work becomes more digital, the JD-R framework has been adapted to encompass both the challenges and supports related to ICT (Ninaus et al., 2021). ICT demands refer to technology-induced pressures such as digital interruptions, information overload, constant availability expectations, and rapid response requirements. These demands often function as techno-stressors that contribute to mental fatigue, work-life interference, and ultimately, burnout (Tarafdar et al., 2019).

ICT Resources

Conversely, ICT resources encompass supportive technological features and systems that facilitate task accomplishment, adaptation, and employee development such as user-friendly software, access to digital tools, IT support, and opportunities for digital skill acquisition (Day et al., 2010; Ninaus et al., 2021). In line with the JD-R framework, these resources not only enhance work efficiency but also contribute to higher levels of work engagement, acting as protective factors that buffer the negative consequences of ICT demands (Bakker & Demerouti, 2007).

The Effect of ICT Demands and ICT Resources on Burnout

Burnout indentified as a condition of exhaustion that affects employees emotionally, mentally, and physically, caused by prolonged and excessive stress, particularly in the workplace context (Schaufeli et al., 2020). Burnout is defined by intense exhaustion, growing negativity or detachment from one's work, and a reduction in job effectiveness (Schaufeli et al., 2020). It consists of four main components: exhaustion, which refers to ongoing physical and emotional tiredness; mental distance, marked by a skeptical or withdrawn outlook toward job responsibilities; emotional impairment, involving challenges in managing emotions during work; and cognitive impairment, characterized by reduced mental abilities like focus and sound decision-making (Schaufeli et al., 2020).

Under the framework of the Job Demands–Resources (JD-R) theory, Burnout develops via the health impairment mechanism, which illustrates how overwhelming job demands drain an individual's physical and mental energy reserves (Bakker & Demerouti, 2007). Within this conceptual framework, ICT-related pressures, stemming from the intensive use of technology in the workplace, are recognized as major drivers of burnout. The growing dependence on digital tools tends to erode the separation between professional and personal domains, giving rise to ICT demands such as continuous connectivity, the expectation of prompt responses, and constant digital accessibility (Abu Farha et al., 2022).

A growing body of empirical evidence consistently indicates that ICT-related demands are positively linked to higher levels of burnout, which in turn negatively impacts employees' overall psychological well-being. Karimikia et al. (2021) identified that pressures stemming from ICT use (ICT demands) contribute to excessive exhaustion due to heightened workload and expectations for permanent availability, thereby increasing personal burnout. Specifically, ICT-related pressures lead to burnout by triggering three forms of technology-induced stress: techno-overload, which involves demands to increase work speed and duration; techno-invasion, where work encroaches upon personal life boundaries; and techno-complexity, which refers to the difficulties in managing and

adapting to complex digital systems (Tarafdar et al., 2007). These stressors amplify occupational stress, which directly or indirectly results in physical and mental exhaustion (Molino et al., 2020).

Zhang et al. (2024) contextualize ICT demands within the spillover-crossover framework, illustrating how excessive digital engagement not only affects individual employees but also extends into their personal lives. Their study indicates that increased ICT accessibility contributes to work-to-family conflict, a form of role interference that intensifies emotional fatigue and accelerates burnout. This constant state of digital connectivity creates spillover effects that magnify stress beyond the workplace, reinforcing the pervasive nature of burnout. Furthermore, Golu et al. (2022) highlight the reciprocal dynamics between job demands and burnout, especially in high-pressure settings like healthcare during the COVID-19 pandemic. Their study confirms that heightened demands without adequate recovery mechanisms create a feedback loop that worsens exhaustion and impairs resilience. Supporting this view, Nuutinen and Bordi (2024) provide evidence that frequent and complex use of technology in daily work routines is associated with negative emotional responses, which are directly linked to burnout symptoms.

Based on this evidence, ICT demands are expected to increase employees' risk of experiencing burnout. Accordingly, the study puts forward the following hypothesis:

H1: ICT demands have a direct positive effect on burnout.

Conversely, ICT resources pertain to the beneficial aspects derived from the use of digital technologies in the workplace, including user-friendly digital systems, reliable access to technical support, opportunities for ICT-related training, and enhanced online communication and collaboration tools (Ninaus et al., 2021). Within the Job Demands–Resources (JD-R) theoretical framework, such resources are considered to have a motivational role, fostering greater work engagement and improving psychological well-being (Bakker & Demerouti, 2007). Flexible work arrangements enabled by ICT, such as the ability to choose when and where to work, are among the most cited benefits. Baumeister et al. (2021) highlighted that ICT resources, particularly those promoting temporal and spatial flexibility, can enhance employees' sense of autonomy and control, thereby reducing work-related stress and minimizing the risk of burnout. This perception of control supports the development of a psychologically safe and supportive work environment, helping to mitigate the impact of job demands.

However, some studies have shown mixed or inconclusive findings. For instance, Ninaus et al. (2021) observed that ICT resources did not significantly influence burnout before or during the COVID-19 pandemic, suggesting that contextual factors and individual differences may shape the effectiveness of ICT resources. Additionally, Karimikia et al. (2021) argued that the availability of ICT resources might inadvertently increase expectations for performance and multitasking, which could, under certain conditions, reduce their protective function. Despite these ambiguities, other empirical evidence supports the buffering role of ICT resources. Riyono & Rezki (2022) found that employees who perceived strong ICT infrastructure and support experienced lower levels of burnout and higher job satisfaction. Their study reinforces the JD-R perspective, emphasizing the importance of digital resources in reducing psychological strain. Similarly, Ninaus et al. (2015) reported that employees who engaged with ICT in a structured and efficient manner benefited from improved work organization and flexibility, which were associated with lower stress and reduced emotional exhaustion.

Taken together, these findings suggest that ICT resources, when optimally implemented and matched to employee needs, can reduce the likelihood of burnout by acting as protective buffers against the negative effects of ICT demands. Accordingly, the following hypothesis is proposed:

H2: ICT resources have a direct negative effect on burnout.

The Effect of ICT Demands and ICT Resources on Digital Overload

Digital overload arises when the continuous influx of information, combined with the use of various digital devices, exceeds employees' cognitive capacity to effectively manage and process information (Abdulkareem et al., 2024). This phenomenon is also known as techno-overload, a form of technostressor in which individuals experience pressure to work faster and manage increased workloads due to the pervasive use of information technology (Tarafdar et al., 2019). Technology

that accelerates work volume may trigger feelings of being overwhelmed and heightened stress due to excessive demands (Tarafdar et al., 2019).

In the public sector, the rapid adoption of digital technologies requires employees to adapt to increasingly complex work systems while simultaneously managing high volumes of digital information (Abdulkareem et al., 2024). These demands are conceptualized as ICT demands, which involve expectations to remain constantly connected, responsive, and capable of handling continuous information flow. Abdulkareem et al. (2024) empirically demonstrated that ICT demands significantly increase digital overload. Similarly, Hwang et al. (2020) found that such expectations intensify employees' cognitive load and stress, as they feel pressured to work faster and more efficiently. Ruiner et al. (2023) also highlighted that higher ICT demands are strongly associated with increased digital overload, primarily due to the pressure to keep up with rapidly evolving and complex digital systems. Ulfert et al. (2022) and Zeike et al. (2019) found that frequent and intensive engagement with technology can substantially contribute to the experience of technology overload. Similarly, Pansini et al. (2023) revealed in their study that the use of ICT frequently amplifies feelings of pressure and time scarcity, thereby reinforcing the cycle of digital overload. These findings consistently indicate that as ICT demands increase, employees are more likely to experience digital overload. Based on this evidence, the following hypothesis is proposed:

H3a: ICT demands have a direct positive effect on digital overload.

Conversely, the use of ICT can provide substantial advantages by improving the accessibility, organization, and information processing, which in turn decreases the time and effort needed to accomplish work-related activities (Hwang et al., 2020). Studi by Ruiner et al. (2023) demonstrated that ICT resources support employees in working more efficiently and accurately, alleviating deadline pressures and simplifying complex tasks. For instance, automation tools can decrease the burden of repetitive work, while structured and accessible information systems help employees maintain focus and reduce confusion caused by excessive information. Enhanced communication technologies further contribute to improved team coordination and faster decision-making, ultimately easing work-related pressures (Ruiner et al., 2023).

In addition, previous studies have shown that when employees perceive ICT as useful and supportive, it can buffer the adverse effects of digital overload, such as emotional fatigue and disruptions to work-life balance (Cambier et al., 2019; Grawitch et al., 2017). Bawden & Robinson (2020) argue that although the phenomenon of information overload persists despite technological advancements, strategies such as intuitive interface design, improved filtering mechanisms, and customized notification systems can empower users to manage information consumption more effectively. These usability enhancements play a crucial role in minimizing common digital distractions and interruptions, which are often associated with the experience of digital overload (Arnold et al., 2023). Moreover, Dingel (2024) found that when ICT tools are strategically integrated, particularly in research-intensive environments, they facilitate faster data processing and foster collaborative work, thereby reducing the cognitive strain linked to managing large volumes of information.

Taken together, the literature reflects a consistent pattern in which ICT resources act as protective factors that help diminish the negative consequences of ICT demands on digital overload by improving usability, supporting task management, and reducing information-related stress. Accordingly, the following hypothesis is proposed.

H3b: ICT resources have a direct negative effect on digital overload.

The Effect of Digital Overload on Burnout

The extensive utilization of ICT in work environments can trigger digital overload, a condition in which employees feel overwhelmed due to the excessive and continuous flow of information. The demands to process information in real time, adapt to evolving technologies, and manage uninterrupted digital communication substantially increase psychological strain and the risk of stress-related outcomes (Hwang et al., 2020; Abdulkareem et al., 2024). These demands are often exacerbated by persistent digital interruptions, such as constant notifications, which interfere with concentration and amplify cognitive fatigue, thereby contributing to burnout symptoms (Martin et al., 2022). Zhang et al. (2025) further emphasize that the pressure stemming from sustained digital

connectivity and the implicit expectation for instant responsiveness can intensify emotional strain among employees, making them more susceptible to exhaustion.

In a similar vein, Adebusuyi (2023) identifies work overload as a critical antecedent of burnout, showing how continuous demands placed on employees, without sufficient support or resources, can foster a heightened risk of emotional distress. Over time, the cumulative effects of digital overload have been linked to declines in both physical and mental well-being (Ninaus et al., 2021), as well as reduced productivity resulting from prolonged exposure to stress (Rasool et al., 2022). Collectively, these findings support a consistent pattern in which digital overload serves as a significant predictor of burnout, underlining the detrimental impact of excessive ICT demands on employee well-being. Accordingly, the hypothesis below is formulated.

H4: Digital overload has a direct positive effect on burnout.

The Mediating Role of Digital Overload

To better understand how ICT demands influence employee well-being, it is crucial to examine the underlying mechanisms that connect the two. Emerging empirical research increasingly emphasizes the role of digital overload as a central explanatory factor in this relationship. Hwang et al. (2020) demonstrated that the information burden generated by instant messaging (IM) leads to cognitive fatigue, manifested in symptoms such as reduced concentration, impaired memory, and mental exhaustion, key indicators of burnout. Likewise, Abdulkareem et al. (2024) found that high ICT demands significantly elevate levels of digital overload, which in turn intensifies emotional exhaustion and work-related stress. Ruiner et al. (2023) further confirmed that persistent ICT demands lead to overload and reduced cognitive functioning, thereby increasing the risk of burnout.

In support of these findings, Sun & Lee (2022) explored the phenomenon of communication overload and identified that frequent disruptions and excessive message delivery via IM platforms result in instant messaging fatigue, a form of digital overload that negatively affects employees' psychological well-being and increases their susceptibility to burnout. Corroborating evidence was also reported by Gabel-Shemueli et al. (2015), whose study in the public sector revealed that work overload driven by high digital communication demands directly contributed to burnout symptoms among healthcare professionals, particularly nurses. Further insights are offered by Kaltenegger et al., (2023), in their findings that digital overload acts as a critical mediating mechanism through which ICT demands impair employee well-being.

Taken together, these studies consistently demonstrate that digital overload serves as an intermediary process through which ICT demands translate into burnout outcomes. Consequently, the following hypothesis is developed.

H5a: Digital overload mediates the positive effect of ICT demands on burnout.

ICT resources, including effective digital systems and supportive technological features, are beneficial in managing workloads, facilitating communication, and providing training opportunities, which might help mitigate stress and ultimately reduce burnout among professionals in various sectors (Day et al., 2012). As the availability of these resources increases, employees could leverage them to streamline their tasks and communicate more efficiently. This potentially decreases the perceived workload and enables a more balanced work-life dynamic, thereby decreasing the likelihood of burnout (Abdulkareem et al., 2024).

The findings of Lingo (2023) suggest that strategies such as digital curation can help manage information overload, supporting the notion that guiding employees in the effective use of ICT resources may buffer against the negative experiences of digital overload. Moreover, as noted by Ndumu (2020), an abundance of digital demands can lead to choice overload, further complicating employees' capacity to manage their work effectively. Consequently, in the context of burnout, focusing on the balance of ICT resource utilization while mitigating digital overload is paramount to reducing stress and enhancing overall mental health in workplace environments (Obasi & Benson, 2025; Marsh et al., 2024). Taken together, these insights suggest that digital overload plays a mediating role in the relationship between ICT resources and burnout. While ICT resources have the potential to reduce burnout, their effectiveness may be diminished if digital overload is not adequately managed. Therefore, it can be hypothesized that digital overload mediates the relationship between ICT resources and burnout.

H5b: Digital overload mediates the negative effect of ICT resources on burnout.

Drawing upon the extended JD-R framework and the hypotheses developed in this study, the conceptual model (Figure 1) categorizes ICT demands as a form of digital job demands and ICT resources as job-related resources. Prior empirical studies (Abdulkareem et al., 2024; Hwang et al., 2020; Ruiner et al., 2023) suggest that these two variables significantly contribute to the emergence of digital overload, which is thus treated as the initial dependent variable in the model. In addition, existing literature confirms that both ICT demands and ICT resources have direct impacts on burnout (Ninaus et al., 2021; Karimikia et al., 2021), positioning burnout as a second dependent outcome. Furthermore, digital overload is proposed to serve as a mediating variable in the impact pathways connecting ICT demands, ICT resources, and burnout, based on empirical support from recent studies (Obasi & Benson, 2025; Abdulkareem et al., 2024; Marsh et al., 2024; Ruiner et al., 2023). As such, digital overload is integrated into the model as a central mediating construct.
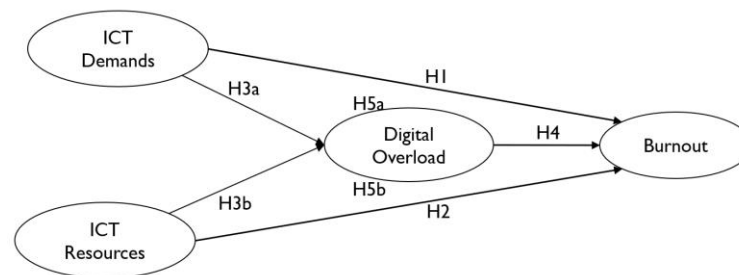
FIGURE 1. Research Model

This research model illustrates how both ICT demands and ICT resources influence employee burnout, either directly or indirectly through digital overload. ICT demands may lead to burnout (H1) due to increased pressure and workload, whereas ICT resources are expected to reduce burnout (H2) by providing supportive tools and efficiencies. At the same time, ICT demands can intensify digital overload (H3a), which occurs when the volume or complexity of ICT use exceeds an employee's capacity to process it. Conversely, ICT resources may help alleviate digital overload (H3b). In turn, digital overload is expected to increase burnout (H4). Lastly, digital overload serves as a mediating variable that links ICT demands and ICT resources to burnout (H5a, H5b).

METHOD

Research Methodology and Empirical Data Collection

This study adopted a quantitative approach with a cross-sectional survey design, aimed at examining the relationships among ICT demands, ICT resources, digital overload, and burnout in the Indonesian public sector context. To empirically test the proposed model, covariance-based structural equation modeling (CB-SEM) was employed as the primary data analysis technique, as it allows for simultaneous testing of both the measurement and structural components of the framework.

To support this approach, purposive sampling was used to select respondents with relevant experience and knowledge related to digital transformation. The sample included 358 civil servants from central office units of Ministry of Primary and Secondary Education, chosen for their strategic roles in ICT policy development, coordination, and system integration across the Ministry. Unlike technical implementing units (*Unit Pelaksana Teknis*/UPT), which use ICT mainly for operational tasks within their own units, central units are more representative for examining ICT's organizational impact. Additional criteria included a minimum of two years of service, ensuring adequate exposure to ICT use, and a range of job positions, from operational and functional staff to supervisory roles (sub-team leaders, team leaders, and echelon III–IV officials). These roles were selected to capture diverse perspectives on ICT demands and resources, as they are directly involved in digital work processes, coordination, system management, and performance monitoring. This method also responds to the gap in the literature highlighted by Abdulkareem et al. (2024).

Prior to conducting the primary data collection, a pilot assessment was carried out to evaluate the clarity and readability of the questionnaire. This involved five independent reviewers who assessed the readability of the items. Based on the feedback from this test, a small-scale trial was subsequently implemented by distributing the questionnaire to a group of civil servants at the Ministry of Primary and Secondary Education who met the study's inclusion criteria. A total of 31 responses were gathered during this pre-test stage. The goal of this preliminary test was to examine participant responses and assess the psychometric properties, specifically, the validity and reliability, of the measurement instrument. Analysis of the pre-test data was performed using IBM SPSS Statistics version 26. The findings confirmed that all items in the instrument were both valid and reliable, indicating that the questionnaire was suitable for large-scale administration in the main survey.

The data collection was carried out through an online survey designed using the Google Forms platform. The survey was distributed between February 17 and March 18, 2025, through official letter sent to the heads of echelon II units at the central offices of Ministry of Primary and Secondary Education. Each unit head appointed a person in charge (PIC) to disseminate the questionnaire via WhatsApp groups to ensure coverage among all civil servants. Additionally, printed questionnaires were distributed in two units with initially low response rates. A total of 394 responses were collected; however, 36 responses were excluded due to ineligibility or uniform answers across all items. Consequently, 358 valid responses were retained for analysis.

The collected data were analyzed using covariance-based structural equation modeling (CB-SEM) with LISREL version 8.80. This technique was chosen due to its suitability for simultaneously testing the theoretical framework and the causal relationships among latent constructs (Hair et al., 2019). The analysis begins with an assessment of both the measurement and structural models using Confirmatory Factor Analysis (CFA). Validity is determined by examining the Standardized Factor Loadings, while reliability is measured through Construct Reliability (CR) and Average Variance Extracted (AVE) (Hair et al., 2019). To verify the model's fit with the observed data, Goodness-of-Fit (GOF) indices are evaluated. Lastly, hypothesis testing is conducted to analyze the direct and indirect (mediating) effects among the studied variables.

Based on the explanation of the research design and data collection above, the research process can be summarized in the flowchart presented in Figure 2.
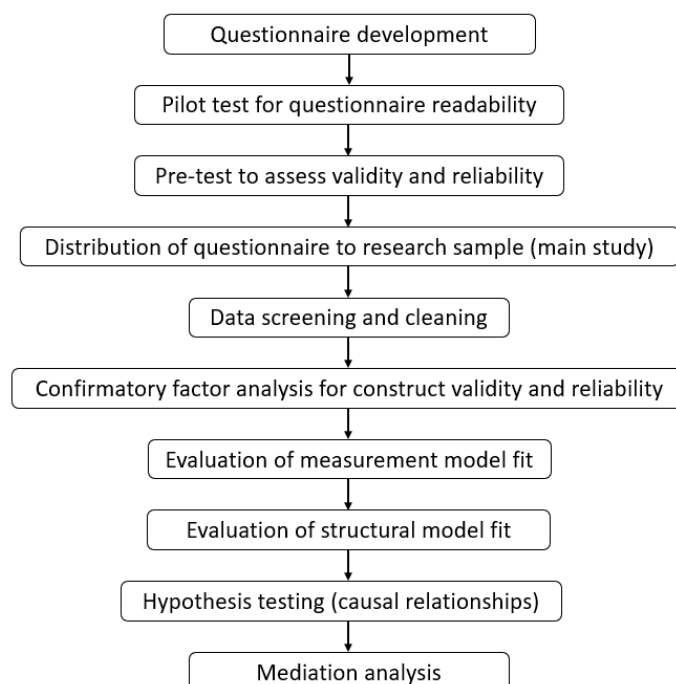
FIGURE 2. Research Flowchart

Measurement

This research involved four key variables: ICT demands and ICT resources as the independent variables, digital overload serving as the mediating variable, and burnout as the dependent variable. A total of 31 items, representing the four constructs, were utilized to assess respondents' perceptions through scale-response items. The measurement tools for ICT demands and ICT resources were adapted from Ninaus et al. (2021), each containing six indicators. Examples of ICT demands indicators include statements such as "I often feel burdened by the demand to complete tasks quickly due to the use of digital technology" and "I feel pressured and disturbed because digital technology makes me constantly reachable at any time." For ICT resources, sample indicators are "Digital technology facilitates coordination and communication in work processes" and "Digital technology enables me to accomplish more tasks in less time." Digital overload was measured with seven indicators adopted from Abdulkareem et al. (2024), including items like "I find it hard to concentrate due to constant digital distractions" and "I often feel stressed or anxious from overreliance on digital technology." Burnout was assessed using 12 indicators based on Schaufeli et al. (2020), covering four dimensions: exhaustion, mental distance, cognitive impairment, and emotional impairment, with examples such as "I struggle to regain energy after a full day of work" and "Sometimes I overreact at work unintentionally." All items were evaluated using a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree), as this format allows for more nuanced and sensitive responses by providing finer distinctions in participants' attitudes. It is also considered to offer better measurement precision and reliability for psychological constructs compared to shorter scales (Aybek & Toraman, 2022).

RESULTS AND DISCUSSION

Demographic Profile of Respondents

Table 1 presents the demographics of the 358 respondents. Gender distribution is effectively balanced, with women exceeding men by just 1.1 percentage points. The dominant age brackets are 40 to 44 years and ≥50 years, whereas those under 25 constitute the smallest share. Nearly half of the participants hold operational staff positions (48.0 %), while Echelon III managers account for the lowest proportion (1.7 %). For tenure, most respondents report more than 20 years of service, whereas fewer than five years make up the smallest segment. Although the sample proportions for age, gender, position, and tenure do not precisely match the population, their rank order aligns with population figures, indicating adequate representativeness. A modest deviation occurs in the Echelon I unit distribution, the Secretariat General is slightly under-sampled (-9.7 %) because several Echelon II offices had not yet granted research permission when data collection closed, yet this gap remains within an acceptable margin.

TABLE 1. Demography of Respondents

Profile	Classification	Total	Percentage
Age	< 25 years old	4	1.12%
	25 to 29 years old	30	8.38%
	30 to 34 years old	54	15.08%
	35 to 39 years old	58	16.20%
	40 to 44 years old	78	21.79%
	45 to 49 years old	56	15.64%
	≥ 50 years old	78	21.79%
Gender	Male	177	49.44%
	Female	181	50.56%
Job Position	Echelon III official	6	1.68%
	Echelon IV official	13	3.63%
	Team leader	17	4.75%
	Sub-team leader	29	8.10%
	Functional staff	121	33.80%
	Operational staff	172	48.04%
Employment Tenure	< 5 years	45	12.57%
	5 to 10 years	72	20.11%
	10 to 14 years	76	21.23%
	15 to 19 years	76	21.23%

Profile	Classification	Total	Percentage
	≥ 20 years	89	24.86%
	• Secretariat General	87	24.30%
	• Inspectorate General	17	4.75%
	• Directorate General of Early Childhood Education, Primary Education, and Secondary Education	62	17.32%
Echelon I Unit	• Directorate General of Vocational Education, Special Education, and Special Services Education	31	8.66%
	• Directorate General of Teachers, Education Personnel, and Teacher Education	118	32.96%
	• Agency for Educational Standards, Curriculum, and Assessment	34	9.50%
	• Agency for Language Development and Cultivation	9	2.51%

Measurement Model

Validity and reliability of the measurement model were assessed through CFA. An item was considered valid when its standardized factor loading (SFL) exceeded 0.30, consistent with Hair et al. (2019) for sample sizes ≥ 350. Reliability of the construct was considered satisfactory when the composite reliability (CR) exceeded 0.70 and the average variance extracted (AVE) met or surpassed 0.50 (Hair et al., 2019).

In light of the CFA results summarized in Table 2, all first-order items demonstrated validity, with standardized factor loadings (SFLs) varying from 0.61 to 0.93. A significant proportion of the items (n = 13) clustered within the range of 0.70 to 0.79. These coefficients indicate strong item–construct relationships and adequate representation of the latent variables (Hair et al., 2019). CR values ranged from 0.77 to 0.92, all surpassing the suggested threshold, confirming that the indicators within each construct yield consistent measurements (Hair et al., 2019). Although the mental distance dimension of burnout exhibited the lowest CR (0.77), it still met reliability criteria. Similarly, all AVE values exceeded 0.50, implying that each construct explains more variance in its indicators than is attributable to measurement error (Hair et al., 2019). Overall, these results demonstrate that each construct in the first-order CFA meets the criteria for validity and reliability, confirming that all items are valid and consistent.

TABLE 2. Result of Confirmatory Factor Analysis

Variable	Dimension	Item	Mean 1st Order	Mean 2nd Order	SFL 1st Order	SFL 2nd Order	CR 1st Order	AVE 1st Order	CR 2nd Order	AVE 2nd Order
ICT Demands	Unidimensional	ICTD1	2.63		0.76					
		ICTD2	2.95		0.76					
		ICTD3	2.80	-	0.73	-	0.88	0.56	-	-
		ICTD4	2.80		0.77					
		ICTD5	2.92		0.82					
		ICTD6	2.43		0.62					
ICT Resources	Unidimensional	ICTR1	6.43		0.65					
		ICTR2	6.28		0.76					
		ICTR3	6.24	-	0.73	-	0.87	0.53	-	-
		ICTR4	6.29		0.82					
		ICTR5	6.49		0.68					
		ICTR6	6.27		0.71					
Digital Overload	Unidimensional	DO1	3.16		0.68					
		DO2	2.79		0.75					
		DO3	2.59		0.86					
		DO4	2.59	-	0.85	-	0.92	0.62	-	-
		DO5	2.34		0.81					
		DO6	2.68		0.80					
		DO7	2.76		0.73					
Burnout	Exhaustion	BO1	2.88		0.87					
		BO2	2.82	2.81	0.76	0.82	0.92	0.61	0.90	0.68
		BO3	2.74		0.71					
	Mental distance	BO4	2.56	2.37	0.81	0.83	0.77	0.52		
		BO5	2.26		0.74					

Variable	Dimension	Item	Mean 1st Order	Mean 2nd Order	SFL 1st Order	SFL 2nd Order	CR 1st Order	AVE 1st Order	CR 2nd Order	AVE 2nd Order
		BO6	2.29		0.61					
	Cognitive impairment	BO7	2.43		0.87					
		BO8	2.36	2.46	0.93	0.84	0.87	0.69		
		BO9	2.59		0.66					
	Emotional impairment	BO10	2.15		0.88					
		BO11	2.19	2.21	0.86	0.81	0.88	0.71		
		BO12	2.30		0.78					

In the next phase, the multidimensional construct of burnout was evaluated with a second-order CFA, also presented in table 2. Following the same decision rules, a dimension was considered valid when its SFL exceeded 0.30, and reliable when the composite reliability (CR) was greater than 0.70 and the average variance extracted (AVE) surpassed 0.50. All four burnout dimensions exhibited second-order SFLs between 0.81 and 0.84, well above the 0.30 benchmark, demonstrating strong convergent validity and a robust link between each dimension and the overarching burnout construct (Hair et al., 2019). The CR reached 0.90, confirming excellent internal consistency among the dimensions, while the AVE exceeded 0.50, indicating that the latent construct explains more variance in its indicators than can be attributed to measurement error (Hair et al., 2019). Consequently, every dimension meets the criteria for validity and reliability, and all indicators are retained for inclusion in the subsequent structural model.

Structural Model Goodness of Fit

Model fit represents a statistical assessment of how well the hypothesized structural model reproduces the observed relationships between latent constructs and their indicators (Hair et al., 2019). Following parameter estimation, three categories of goodness-of-fit (GoF) indices, i.e. absolute, incremental, and parsimony, are employed to evaluate the degree of fit between the model-implied and observed covariance matrices. As shown in Table 3, nine out of eleven indices (RMSEA, SRMR, NFI, NNFI/TLI, CFI, IFI, RFI, PGFI, and PNFI) exceed the recommended thresholds, indicating a generally good model fit. In contrast, GFI and AGFI fall within the marginal range, suggesting a portion of the variance-covariance structure remains unexplained. According to Hair et al. (2019), reporting three to four fit indices, at least one from the absolute and one from the incremental category, is sufficient to establish model adequacy. In this research, three absolute fit indices, five incremental fit indices, and one parsimony index meet the good fit criteria. Thus, the conclusion is that the structural model demonstrates a good fit, indicating that the hypothesized model accurately represents the actual empirical relationships and is suitable for further analysis.

TABLE 3. Model Fit Test Results

Goodness of Fit Indicators	Standard Value	Result	Conclusion
Absolute Fit Indices			
Goodness-of-Fit Index (GFI)	good fit → GFI ≥ 0.9 marginal fit → 0.8 ≤ GFI ≤ 0.9	0.8532	Marginal fit
Root Mean Square Error of Approximation (RMSEA)	good fit → RMSEA ≤ 0.08 close fit → RMSEA ≤ 0.05	0.07897	Good fit
Standardized Root Mean Residual (SRMR)	good fit → SRMR ≤ 0.08	0.05312	Good fit
Normed Chi-Square	Good fit → 3:1	3.13:1	Good fit
Incremental Fit Indices			
Normed Fit Index (NFI)	good fit → NNFI ≥ 0.9 marginal fit → 0.8 ≤ NNFI < 0.9	0.9697	Good fit
Tucker Lewis Index (TLI) or Non-Normed Fit Index (NNFI)	good fit → NFI ≥ 0.9 marginal fit → 0.8 ≤ NFI < 0.9	0.9620	Good fit
Comparative Fit Index (CFI)	good fit → CFI ≥ 0.9 marginal fit → 0.8 ≤ CFI < 0.9	0.9738	Good fit
Relative Fit Index (RFI)	good fit → RFI ≥ 0.9 marginal fit → 0.8 ≤ RFI < 0.9	0.9561	Good fit
Incremental Fit Index (IFI)	good fit → IFI ≥ 0.9 marginal fit → 0.8 ≤ IFI < 0.9	0.9738	Good fit

Goodness of Fit Indicators	Standard Value	Result	Conclusion
Parsimony Fit Indices			
Adjusted Goodness of Fit (AGFI)	good fit → AGFI ≥ 0.9 marginal fit → 0.8 ≤ AGFI < 0.9	0.8150	Marginal fit
Parsimony Normed Fit Index (PNFI)	good fit→ PNFI ≥ 0.50	0.8327	Good fit

Hypotheses Testing

The hypotheses were tested using CB SEM with LISREL 8.8. SEM to evaluate and estimate causal relationships by assessing how well the proposed model fits the observed data (Hair et al., 2019). The coefficient of determination (R^2) values from the structural model are depicted in Figure 3. The value of R^2 for digital overload is 0.72, suggesting that 72% of its variance is accounted for by ICT demands and ICT resources, with the other 28% being affected by factors not explored in this study. Similarly, the R^2 for burnout is 0.41, suggesting that ICT demands, ICT resources, and digital overload together explain 41% of the variance in burnout, with 59% attributed to other potential variables not included in the model. This implies that further research may benefit from incorporating additional predictors to enhance the model's explanatory capacity.

The strength and significance of the relationships between latent variables were assessed using t-values derived from the analysis. In a one-tailed hypothesis test with a 95% confidence level, a t-value equal to or greater than 1.645 is considered indicative of a statistically significant association (Hair et al., 2010). The path diagram in Figure 3 visually presents the hypothesis testing results, while Table 4 provides a detailed summary of the statistical outcomes.
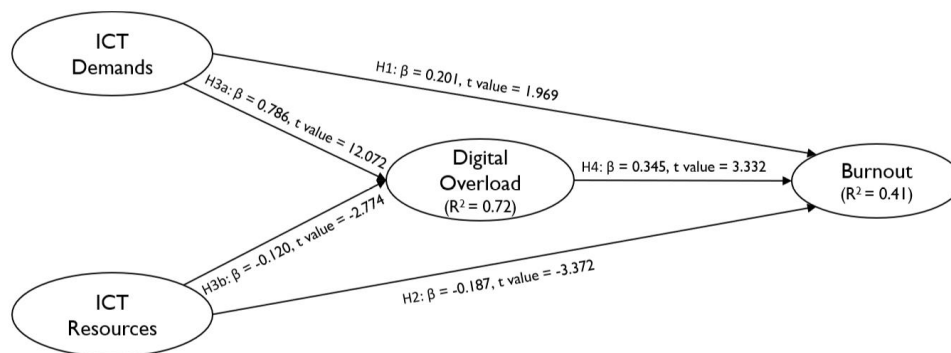
FIGURE 3. Path Diagram of the Structural Model

Based on the results obtained presented in Table 4 and Figure 3, the path coefficient (β) and t-value provide evidence that all research hypotheses are confirmed. The direct path analysis demonstrated that H1 was accepted (β = 0.2009, t = 1.9688), H2 was accepted (β = -0.1867, t = -3.3724), H3a was accepted (β = 0.7856, t = 12.0723), H3b was accepted (β = 0.1205, t = -2.7736), and H4 was accepted (β = 0.3454, t = 3.3320).

TABLE 4. Result of Hypotheses Testing

Hypotheses	Path	Standardized Coefficient (β)	t-values	Conclusion
H1	ICT Demands → Burnout	0.201*	1.969	Accepted
H2	ICT Resources → Burnout	-0.187***	-3.372	Accepted
H3a	ICT Demands → Digital Overload	0.786***	12.072	Accepted
H3b	ICT Resources → Digital Overload	-0.120**	-2.774	Accepted
H4	Digital Overload → Burnout	0.345**	3.332	Accepted
H5a	ICT Demands → Digital Overload → Burnout	0.271***	3.319	Accepted
H5b	ICT Resources → Digital Overload → Burnout	-0.042*	-2.175	Accepted

Note:
Asterisks denote statistical significance levels:
$p < 0.05$ = *, $p < 0.01$ = **, $p < 0.001$ = ***

To examine the mediating role of digital overload, both direct and indirect effects were analyzed. As presented in Table 5, the path from ICT demands to burnout through digital overload (H5a) shows a significant indirect effect (β = 0.271, t = 3.319) alongside a still-significant direct effect (β = 0.201, t = 1.969), resulting in a total effect of 0.472 (t = 7.655). These results indicate partial mediation. Similarly, for H5b, ICT resources exhibit a negative mediated effect on burnout via digital overload (β = –0.042, t = –2.175) and a significant direct effect (β = –0.187, t = –3.372), with a total effect of –0.228 (t = –4.005), also supporting partial mediation. These findings follow Hair et al. (2019), who state that partial mediation is established when the mediator reduces but does not eliminate the significance of the direct path.

TABLE 5. Result of Mediation Analysis

Hypotheses	Path	Direct Effect	Indirect Effect	Total Effect	Conclusion
H5a	ICTD → DO → BO	0.201*** (t = 1.969)	0.271*** (t = 3.319)	0.472*** (t = 7.655)	Partial Mediation
H5b	ICTR → DO → BO	-0.187*** (t = -3.372)	-0.042* (t = -2.175)	-0.228*** (t = -4.005)	Partial Mediation

Note:
ICTD: ICT Demands   DO: Digital Overload
ICTR: ICT Resources   BO: Burnout
Asterisks denote statistical significance levels:
$p < 0.05$ = *, $p < 0.01$ = **, $p < 0.001$ = ***

Discussion

This study contributes to advancing the Job Demands–Resources (JD-R) framework by empirically extending its application to the digital work context, specifically highlighting the dual role of Information and Communication Technology (ICT) as both a job demand and a job resource. In doing so, it adds conceptual clarity to how digital technologies influence employee well-being in underexplored settings such as public institutions in developing countries. While previous studies have largely concentrated on the adverse effects of ICT use, such as ICT demands, digital overload, and burnout, within Western or private-sector environments (Abdulkareem et al., 2024; Abu Farha et al., 2022; Fleischer & Wanckel, 2023; Ninaus et al., 2021; Nuutinen & Bordi, 2024; Ruiner et al., 2023), this study offers balanced insights into how ICT can simultaneously act as a burden and a buffer, particularly in the Indonesian public sector. Moreover, it addresses a significant gap in the JD-R literature by empirically validating ICT resources as psychological enablers, a dimension that remains underdeveloped and debated (Baumeister et al., 2021; Day et al., 2012).

The first major finding reveals that ICT demands have a significant positive impact on burnout. This supports the JD-R proposition that persistent and excessive demands exhaust an employee's psychological capacity and lead to emotional depletion (Bakker & Demerouti, 2007). The quantitative evidence (β = 0.2009, t = 1.9688) confirms that ICT-related job demands contribute meaningfully to burnout. This relationship is consistent with earlier studies (Abu Farha et al., 2022; Golu et al., 2022; Karimikia et al., 2021; Molino et al., 2020; Nuutinen & Bordi, 2024), and gains additional contextual relevance in the Indonesian public sector, where bureaucratic rigidity, mounting digitalization pressures, and insufficient infrastructure can intensify the psychological burden of ICT (Kementerian Komunikasi dan Informatika, 2024). Real-time digital responsiveness, coupled with outdated systems or unclear digital workflows, creates a disconnect between expectations and capabilities, amplifying strain.

Conversely, the second finding confirms that ICT resources significantly reduce burnout levels (β = –0.1867, t = –3.3724), offering evidence against earlier inconsistent results, such as those reported by Ninaus et al. (2021). When digital tools are well-integrated, provide autonomy, facilitate coordination, and are backed by technical support, they function as job resources that buffer the negative effects of work demands (Baumeister et al., 2021; Karimikia et al., 2021; Ray & Pana-Cryan, 2021; Riyono & Rezki, 2022). In line with the JD-R theory, these resources act not only as performance enablers but also as psychological protectors that foster resilience. This is particularly significant in public institutions with fragmented support structures (Obasi & Benson, 2025), where such resources may serve as substitutes for lacking managerial or organizational support.

The third and fourth findings deepen our understanding of how ICT demands and resources interact with digital overload. The data show that ICT demands strongly increase digital overload (β = 0.7856, t = 12.0723), while ICT resources reduce it (β = –0.1205, t = –2.7736). This reinforces the paradoxical nature of digital technology, whereby its influence on employees depends on its framing as either a demand or a support (Srivastava et al., 2015; Tarafdar et al., 2019). While ICT demands may increase task fragmentation and responsiveness pressure, ICT resources may help structure and streamline digital work. These findings empirically validate the dual and opposing roles of ICT in influencing digital overload (Abdulkareem et al., 2024; Hwang et al., 2020; Ruiner et al., 2023). In public sector settings, where reporting chains are rigid and digital tools are often adopted without sufficient training or contextualization, this overload is exacerbated. Thus, merely providing technology is not sufficient; the design, accessibility, and user orientation of digital systems are equally critical.

The fifth finding confirms that digital overload significantly predicts burnout (β = 0.3454, t = 3.3320), aligning with a growing body of literature (Adebusuyi, 2023; Hwang et al., 2020; Martin et al., 2022; Rasool et al., 2022; Q. Zhang et al., 2025). The R^2 value for burnout is 0.41, indicating that nearly half of the variance in burnout can be explained by ICT demands, resources, and digital overload. This confirms that digital overload is not a secondary byproduct, but a central mechanism through which the impact of ICT manifests in public-sector burnout. The complex working environment, characterized by unclear digital boundaries, multi-layered bureaucracy, and high expectations for responsiveness, intensifies emotional fatigue and depersonalization. These outcomes call for institutional-level digital hygiene strategies, such as controlling ICT intensity, minimizing digital interruptions, and allocating recovery time (Lingo, 2023).

The sixth and seventh findings clarify the partial mediating role of digital overload in the ICT–burnout link. The indirect effect from ICT demands to burnout through digital overload (β = 0.271, t = 3.319) and from ICT resources to burnout (β = –0.042, t = –2.175), both show statistically significant mediation, while their direct effects remain significant. These patterns fulfill Hair et al.'s (2019) criteria for partial mediation. Digital overload, therefore, operates as a cognitive–emotional transmission channel, through which both harmful (demands) and beneficial (resources) aspects of ICT influence psychological well-being (Gabel-Shemueli et al., 2015; Lingo, 2023; Marsh et al., 2024; Obasi & Benson, 2025; Rasool et al., 2022; Ruiner et al., 2023; Sun & Lee, 2022). Practically, the findings show that simply improving ICT infrastructure or offering more tools is not enough. Without strategies to manage digital saturation, such as prioritization filters, clear boundaries for after-hours communication, and simplified system designs, even useful ICT resources may fail to mitigate burnout (Marsh et al., 2024; Ndumu, 2020).

In sum, this study makes three significant contributions. First, it empirically advances the JD-R framework by showing how ICT can simultaneously function as a demand and a resource in digital work environments, validating the dual-role theory in a developing-country context. Second, it addresses a notable geographical and sectoral gap by focusing on public-sector employees in Indonesia, an area where digital transformation is intensifying, but implementation remains uneven and constrained. Third, it emphasizes the mediating role of digital overload as a pivotal mechanism that explains the mixed outcomes found in previous research on ICT and employee well-being. Together, these findings imply that digital transformation in public institutions must go beyond infrastructure provision. It requires a holistic strategy that integrates usability, workload regulation, digital literacy, and employee well-being into system design and policy frameworks. Without such balance, ICT's role as a supportive resource risks being overshadowed by its unintended function as a persistent psychological demand.

LIMITATION

Like many empirical investigations, this research is subject to several inherent limitations that should be taken into account when interpreting its outcomes. First, the use of a cross-sectional design limits the ability to draw definitive conclusions about causality among the examined variables. Second, relying solely on self-reported data introduces potential biases, including recall errors and social desirability tendencies, which may compromise the reliability and validity of the findings. Lastly, this research does not incorporate variations in individual digital skills, which may shape how

employees experience and manage ICT demands, available ICT resources, and the resulting digital overload. These unaccounted-for personal variables may serve as significant moderators within the hypothesized relationships. Future research is encouraged to address these limitations by employing longitudinal or experimental designs to test causal mechanisms, incorporating multi-source or objective data to reduce potential bias, and including relevant moderating variables such as digital self-efficacy, adaptability, or digital literacy. Furthermore, cross-sectoral or cross-cultural studies could provide deeper insights into contextual variations in digital overload experiences and examine the role of organizational interventions, such as boundary management policies, in mitigating burnout.

CONCLUSION

This research offers valuable insights into the impact of ICT demands and ICT resources on employee burnout within the public sector, highlighting both direct effects and indirect influences through digital overload. Grounded in the Job Demands-Resources (JD-R) framework, the study reveals that heightened ICT demands increase the likelihood of burnout, especially when digital overload is not effectively controlled. In contrast, ICT resources act as protective factors that mitigate burnout by reducing digital stress, although their effectiveness depends on the level of digital workload faced by employees. The empirical evidence supports the partial mediating role of digital overload in the positive association between ICT demands and burnout, as well as the negative association between ICT resources and burnout. These findings emphasize the essential need to manage digital demands while simultaneously enhancing supportive ICT infrastructure.

Practically, the study suggests that public organizations adopt holistic digital well-being strategies, including improved system integration, consistent digital platforms, and policy frameworks that protect personal boundaries, such as limiting after-hours digital communication. Providing training on digital tool usage and managing information flow is also essential for minimizing psychological strain. This study theoretically advances the JD-R model by highlighting the dual function of ICT as both a job demand and a job resource within digital work settings. It also addresses inconsistencies in previous literature regarding the role of ICT resources by emphasizing their conditional impact based on digital intensity. Ultimately, the study bridges the conceptual expectations presented in the introduction with the empirical findings discussed, offering both a meaningful theoretical extension and practical implications. These results pave the way for future studies and the development of interventions focused on creating healthier and more sustainable digital workplaces.

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