HOW DIGITALISATION AFFECTING EMPLOYEES WELL-BEING DURING COVID-19 OUTBREAK: A META-ANALYSIS STUDY

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Abstract

The COVID-19 pandemic is having a profound impact, with far-reaching impacts on the way people live and work around the world. The increasing digitization of the workplace during this pandemic has led to changes in working conditions, which can be a risk factor for decreased well-being and performance. Due to the social distancing requirements of the pandemic, workers have experienced a transformative change in working conditions with the rapid adoption of digital technology. The aim of this research is to conducted a literature study to explain especially how digital technology or digitization can affect employees well-being during the COVID-19 outbreak. The research method used is a literature study using 25 reviewed journals that published from 2019-2021. Research findings identify adverse psychosocial effects on the well-being of employees affected by digitalization during the COVID-19 outbreak, including: technostress, work stress, workload, anxiety, burnout, fatigue, and isolation.

***Keywords**: COVID-19, digitalisation, meta-analysis, employee well-being*

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INTRODUCTION

The COVID-19 pandemic is having a profound impact, with far-reaching impacts on the way people live and work around the world. This global crisis has developed into a kind of "catalyst" for adopting and increasing the use of digitalization in work and office organizations, while presenting both predictable and unexpected opportunities, challenges, and costs—leading to both negative and positive feedback (Amankwah-Amoah, Khan, Wood & Knight, 2021). Tremendous growth in digitization has occurred in response to situations affected by the virus at personal, social and organizational levels (López, Mateos & Hernández, 2021). Digital work provides many new aspects of working life, such as working in virtual teams, mobile work, blurring between leisure and work, the expectation of constant availability, and the frequent need to adapt to digital changes and learn new digital tools (Bordi, Okkonen, Mäkiniemi, & Heikkilä-Tammi, 2018; Köffer, 2015). Due to the COVID-19 lockdown, many employees have suddenly switched from traditional work modalities to remote work. Remote work can have several positive outcomes, such as improved performance, cutting "home-work-home" travel costs, saving organizational time and resources, and increasing employee satisfaction (Barbuto, Gilliland, Peebles, Rossi & Shrout, 2020; Thulin, Vilhemson, & Johansson, 2020), however, some negative consequences have also been highlighted,

especially in relation to well-being, and they can lead to stress, discomfort, and anxiety due to continuous use of the Internet, email, instant messaging, and smartphones (Salanova, Llorens & Cifre, 2013).

The constant use of ICT for work-related activities raises another point that could be a risk factor for employee well-being. The increasing number and use of ICT can lead to higher job demands in terms of mental and emotional burden, which can jeopardize the well-being of employees (Salanova, Llorens & Cifre, 2013). Thus, the need for support in the use of digital devices and the need to build competence in dealing with digital media is increasing (Shu, Tu, & Wang, 2011). In the past, the increased requirements to be able to handle digital tools were also investigated under the term "technostress." Technostress is described as the mental stress that employees experience when they are asked to learn and use new technology (Weil & Rosen, 1997). If the technology used changes too quickly, employees have difficulty dealing with change, which can increase workload and stress (Ayyagari, Grover & Purvis, 2011). In a recent contribution, Molino et al. (2020) reported on the effects of technology use on well-being during COVID-19 mandatory remote work, or teknostress, namely "the stress that users experience as a result of application multitasking, constant connectivity, information overload, frequent system upgrades and the resulting uncertainty, continuous relearning and work-related insecurity, and technical issues related to the use of ICT in organizations" (Tarafdar, Tu, & Ragu-Nathan, 2010).

Among the challenges that digitization heralds, of particular relevance attaches to its implications for the workplace climate (Palumbo, Manna & Cavallone, 2020). Digitization is also thought to reduce the human touch of the work experience, leading to greater job insecurity associated with increased difficulty in interacting with coworkers (Goetz & Boehm, 2020). In addition, a digitized workplace is likely to disrupt face-to-face relationships with coworkers and supervisors, impairing individual perceptions of well-being at work (Zhang, Wang, Liu & Xu, 2016). Digitization of work is expected to determine longer and irregular working hours, conditions that further disrupt the psychosocial well-being of employees (Palumbo, 2020). In summary, digitization produces side effects on working conditions, leading to increased psycho-social risks in the workplace (Vanhercke, Ghailani & Sabato, 2018).

Based on the data obtained, the increasing digitization of the workplace causes changes in working conditions which can be a risk factor for decreasing well-being and performance. Due to the social distancing requirements of the pandemic, workers have experienced a transformative change in working conditions with the rapid adoption of digital technology. This goal is especially important at a time when the pandemic is rapidly changing working conditions and increasing the use of digital technology. Our literature study highlights the impact of digitization on employee well-being during the pandemic and offers insights to better support their well-being with the ongoing demands of the COVID-19 pandemic. This article specifically presents a subset of findings that help understand and explain how the impact of digitalization affects aspects of employee well-being during the COVID-19 pandemic.

LITERATURE REVIEW

Employee well-being. The concept of well-being can be analyzed from different points of view. From a macro perspective, it includes aspects such as life expectancy, poverty levels, and environmental factors. From the individual's point of view, it includes

a subjective or psychological measure of an individual's well-being—this includes a personal assessment of the quality of life and quality of work, as determined by three main aspects: physical, social, and psychological. Well-being, the state in which a person feels good, healthy and happy, is associated with connections to all areas of life, with work activities and job functions play a special role (Juchnowicz & Kinowska, 2021).

According to the World Health Organization, the definition of employee well-being, at its core, is the state in which every employee's understanding of their abilities, coping with life pressures, working productively, and contributing to the community (Misselbrook, 2014). Studies have shown that psychological well-being in the work process, is the most important factor in well-being (Johnson et al, 2018). Therefore, well-being is conceptualized in terms of psychological well-being construct (Ryff, 1989), based on individual development and self-actualization along six dimensions: positive attitude towards oneself, trust in interpersonal relationships, and acceptance. Govern the sense of freedom from norms that cannot be done. Opportunities to develop everyday life, the ability to manage and contribute to the environment, the purpose of life, and its potential. The first three dimensions are derived from the theory of self-actualization and self-determination (Ryff, 1989; Deci et al., 2001). The last three are derived from the concept of optimal mastery and function. Another research department on workplace well-being has also appeared in the literature, which is defined as the comprehensive experience and ability of employees to function in both physical and psychological dimensions. This construction corresponds to the specificity of the work carried out in stable conditions and subordinated structures (Juchnowicz & Kinowska, 2021).

From the above explanation, it can be concluded that employee well-being is a concept that indicates an individuals' assessment of their quality of life and work, in which they understand their abilities, cope with life's pressures, work productively, and contribute to it. Public. Employee well-being is one of the top priorities in this crisis situation, especially in the context of the pandemic and the digitization of work. Digitization brings with it increased time pressure and intensification of work effort, which tends to compromise employees' ability to deal with psycho-social tensions in the workplace. Working conditions affect not only the physical but also increasingly have an impact on the psychological well-being of employees. Most of the results are related to the areas of general stress, mental health, and technostress. Therefore, there is a need to clarify how digital technology affects employee well-being during COVID-19 outbreak.

RESEARCH METHOD

Procedure

Data was collected by searching for journals through electronic media such as digital libraries, Google Scholar, emerald.com, MDPI, Sciencedirect.com, Researchgate.net, SagePub.com, op.europa.eu and pubmed.ncbi.nlm.nih.gov. We used a methodology previously developed for systemactic reviews to create glosarries containing search terms related to the subject to enable the development of relevant search strategies. The search string combines terms including health effects, psychological effects, well-being effects, new technologies and jobs, and the general term technostress. The search is not intended to be exhaustive (i.e. identify all published papers on the topic), but is carried out in a systematic manner to reliably demonstrate the current impact of working with new forms of technology on the psychosocial effects,

affecting the well-being of workers during work - 19 outbreaks. Journals obtained by researchers come from International Journal of Sociology and Social Policy; Journal of Medical Internet Research; Wolters Kluwer Public Health Emergency Collection; Oxford University Press Public Health Emergecy Collection; Information; International Journal of Environmental Research and Public Health; Journal of Business Research; Proceedings of the IE 2019 International Conference; International Salerno Conference Proceedings; Article Research; and Proceeding of Statistics and Economics.

Analyzed Data Criteria

From a search of research journals published from 2019-2021, 25 journals have been obtained that meet significant findings to be analyzed using this literature study, namely various factors including adverse psychosocial or mental effects on employee well being related to the adoption of digital technology during the COVID-19 outbreak, specifically dedicated to work arrangements. A summary of the steps of the procedure can be seen in Table 1. The papers that were finally included in the research are listed in the bibliography (which is not highlighted).

Table 1: Summary of the paper selection procedure

Number of papers identified as a result of searching the literature databases	Number of papers selected based screening of title	Number of papers selected for full-text screening	Number of papers included in the briefing
24,000	197	86	25

Due to the volume of papers, (see Table 1) we apply several criteria (both for the technostress method and the whole string) to decide which articles to include in the full review. Details of these criteria are presented in Table 2 below.

Table 2. Criteria of the paper selection procedure

Criteria	Inclusion
Type of technology	New forms of technology (video conference, meeting virtual), smartphones, tablets.
Type of health effect	Health/Psychological effects related to the use of technology in the workplace.
Occupation	Employee or worker oriented studies.
Year of publication	Papers published after 2019.
Type of study	Reviews, surveys.

The final selection of papers consisted of 25 studies covering adverse psychosocial or mental effects in relation to digital technology adoption, exclusively dedicated to occupational settings. Of these, 23 are primary studies, one review and one paper which is a combination of review and main study. The primary study includes both qualitative and quantitative elements.

RESULTS AND DISCUSSION

From some of the literature that we have reviewed, it seems that the term technostress serves as a convenient collective term to express the adverse psychosocial

effects caused by the introduction of the use of new technology systems on employee well being during the COVID-19 outbreak. The details of these specific findings are presented in Table 3 below.

Table 3: Specific findings from literature

Authors (year)	Significant findings
Amankwah-Amoah et. al (2021)	Emerging technology adoption may be hindered by external interests, nostalgia, and employer opportunism, as well as negative effects on employee well-being that undermine productivity, work-life balance, and the future of work. In organizational level constraints, productivity is undermined by employee stress caused by job intensification.
Abilleira, Rodicio-Garcia, Rios-de Deus, and Mosquera-Gonzales (2021)	Components of the subjective experience of technostress experienced by workers by grouping them into what they call technostress, namely the unpleasant sensation of technostress produced by an imbalance between humans and the technological environment in which they do their work.
Ashcroft, Sur, Greenblatt, and Donahue (2021)	Social workers have quickly adapted to virtual care and have integrated innovative technologies into practice in astonishing ways. Social workers also experience personal and professional burdens. Stress, fatigue and burnout, increased workload, job loss, and early retirement are just a few of the many medical costs incurred by social workers.
Borle, Boerner-Zobel Voelter-Mahlknecht, Hasselhorn, and Ebener (2021)	Use of ICT, per se, does not negatively impact older workers. Digital work intensification may be associated with poorer mental health and workability.
Bozkurt (2020)	The results show that most people have experienced increased anxiety and depression. As the COVID-19 pandemic has affected everyone, its impact is more negative on people whose jobs are not suitable for online work, private or self-employed employees, and low-income, low-educated, and poor people.
Bregenzer and Jimenez (2021)	The four risk factors for digital work (distributed teamwork, mobile work, constant availability, and inefficient technical support) are associated with higher stress in the workplace. In addition, distributed teamwork and inefficient technical support are associated with lower work-related resources.
Díaz, et.al (2021)	Given the challenges that organizations face regarding digitization and process automation, technological tools play an important role in supporting decision-making. Changes in the workforce go hand in hand with occupational health and occupational health, hence the importance of using algorithms that optimize solutions to address psychosocial risks. The scheme is presented that, based on the detection of psychosocial risk factors in a firm, mapping to the MKP optimization model, and the solution using the SA algorithm, can obtain a subset of risk factors for the firm with the maximum value at the level of care.
Dubosson, Fragniere, Junod, Meier and Varone (2019)	Aims to develop a human risk platform that is accessed via SaaS (Software as a Service). The solution relies on data collection and processing to measure human-related risks, analyze data and provide a unique score for the company.

Table 3: Specific Findings From Literature (Continued)

Authors (year)	Significant findings
Galanti, Guidetti, Mazzei, Zappalà and Toscano (2021)	Social isolation and work-family conflict are proven to be important job demands of remote work which can significantly decrease productivity and work engagement on the one hand and increase job stress on the other. Disruptive environments appear to have a negative influence on people's motivational drivers.
Juchnowicz and Kinowska (2021)	Working exclusively remotely has been shown to have a negative impact on well-being in terms of workplace relationships and work-life balance. There is no statistically significant relationship between remote work and subjective health assessments. The results have important implications for managing employee well-being in remote work settings.
Jukic et. al (2020)	Cognitive processes are thought to act as a psychological response to prolonged stress and are usually expressed by negative emotions such as anxiety, depression, and anger. Work stress, has been shown to cause decreased general well-being, psychological tension with increased anxiety and depression, and reduced cognitive abilities, such as concentration and productivity at work, along with increases in biological stress markers.
Karani and Mehta (2021)	The support of supervisors and coworkers contributes positively to the fulfillment of psychological contracts. Furthermore, psychological contract fulfillment contributes positively to job involvement. Along with innovative behavior, four forms of well-being, namely emotional, psychological, workspace and life were studied as outcome variables.
López, Mateos, and Hernández (2021)	Technostress has a high impact on the individual scope of students and there is a significant relationship between user type and techno-anxiety.
Molino et. al (2020)	The literature shows several symptoms associated with technostress, such as anxiety, physical illness, behavioral tension, technophobia, mental fatigue, memory impairment, poor concentration, irritability, feeling tired, and insomnia. Among the main frequent consequences of technostress, recent studies found decreased worker productivity, job performance, job satisfaction and organizational commitment, decreased intention to use ICT and increased turnover intention.
Palumbo (2021)	Digitalization exacerbates psycho-social stress in the workplace. Increasing time pressure and intensive work, digitalization is jeopardizing employee well-being. Occupational health partially mediates the implications of digitization on psycho-social risks. Psycho-social risks in the workplace cannot be ignored, such as time pressure and difficulty in establishing good interpersonal exchanges in the workplace as major sources of stain for employees.
Palumbo, Manna and Cavallone (2021)	The introduction of digital technology in the workforce function does not affect personal performance indicators in any way, but contributes to the efficiency of the entire organization. In addition, most of the employees interviewed did not feel the effect of digitization on their psychological well-being; more often they experience positive emotions and interest in learning new digital technologies.

Table 3: Specific Findings From Literature (Continued)

Authors (year)	Significant findings
Pelaez, Erro-Garces, Garcia, and Kiriakou (2021)	COVID-19 has accelerated the digitization process which has resulted in relevant changes in work relationships and, consequently, in corporate organizations. An increase in the number of people working remotely means an increasing number of workers who will be affected by work related risks, social isolation affects mental health. Stress also increases in remote work environments, especially when social care activities are developed while working remotely.
Polents, Fedorova, and Zarubina (2020)	How the competency requirements and job responsibilities of employees are changing, and how these changes affect their psychosocial well-being in the workplace.
Sandoval-Reyes, Acosta-Prado, and Sanchís-Pedregosa (2019)	The results confirmed the negative effect of technology use on psychological detachment from work and the positive correlation between technology and work overload. The permanent connection to the world of work as a result of new technologies increases the likelihood of extended workdays and excessive workloads, which in turn affects the probability of achieving an adequate level of detachment.
Satpathy, Patel and Kumar (2021)	Industrialists claim to have increased employee productivity while working remotely. Our findings show that "technology insecurity" has been considered the greatest stressor among employees in the IT sector while working from home.
Savolainen, Oksa, Savela, Celuch, and Oksanen (2021)	Perceived loneliness, psychological distress, technostress, and neuroticism were identified as strong psychological predictors of COVID-19 anxiety. Increased psychological stress and technostress during the COVID-19 crisis predicts higher COVID-19 anxiety. Increased anxiety is a potential risk factor for well-being in the workplace.
Schreibauer, Hippler, Rieger and Rind (2020)	Employment and working conditions are important determinants of psychological well-being. Research has shown that high employment and adverse psychosocial factors are significantly associated with poorer well-being. Poor psychological well-being is a signal of occurrence and an indication of possible depression.
Spagnoli et. al (2020)	The study indicated that high levels of authoritarian leadership enhanced the positive relationship between workaholism and technostress and that it boosted the effect of workaholism on technostress.
Taser, Aydin, Torgaloz and Rofcanin (2022)	Finding and exploring that the existence of technostress and loneliness are related to the occurrence of digitalization, namely e-working remotely, which most workers in the world experience. Technological stress occurs when there is constant use of electronics, and the loneliness you feel when you work alone.
Zeike, Kyung-Eun, Lindert, Pfaf (2019)	The level of challenging cognitive demands in the workplace increases and negatively affects the psychological well-being of managers.

Based on the analysis of selected papers, we identified various potential side effects. It can be seen that, despite the general term technostress, work stress, work overload, anxiety and burnout are the most frequently explored issues and the scale of

evidence is in most cases limited to a small number of papers. It seems that the term technostress serves as a convenient collective term to express the adverse psychosocial effects caused by digital work during the COVID-19 outbreak. The specific findings of this paper are presented in the following paragraphs.

Technostress. Stress due to technology use causes fatigue, anxiety, lack of sleep, depression and decreased performance (Abilleira et al., 2021). There are five creators of technostress: (1) techno-overload, related to the potential of ICT to force users to work faster and longer or to change work habits; (2) techno-invasion, refers to the ability of ICT to invade users' private lives and make the line between work and personal context more blurred; (3) techno-complexity, describing situations where the features and complexity of ICTs make users feel inadequate with respect to their skills; (4) techno-insecurity, related to the feeling of potential users being threatened with losing their jobs, because they are replaced by automation or other people who have better ICT knowledge; and (5) techno uncertainty, related to the continuous improvement and change of ICTs which annoys users and forces them to continuously learn new aspect of ICT (Tarafdar, Tu, Raghu-Nathan & Raghu-Nathan, 2007). Some of the symptoms associated with technostress, such as physical illness, behavioral tension, technophobia, mental fatigue, memory impairment, poor concentration, irritability, feeling tired, and insomnia. Among the main frequent consequences of technostress, recent studies found decreased worker productivity, job performance, job satisfaction and organizational commitment, decreased intention to use ICT and increased turnover intention (Molino et al., 2020). Technostress is also reported to have a high impact on the individual scope of students and there is a significant relationship between user type and techno-anxiety (López, Mateos, & Hernández, 2021). In a quantitative study it was shown that "fear of losing a job due to new ICTs" as being highest weighted seemed to be the most pressing issue while "working outside office hours" had the lowest weight (Satpathy, Patel & Kumar, 2021). A quantitative study showed that "technology insecurity" has been considered the greatest stressor among employees in the IT sector while working from home (Satpathy, Patel & Kumar, 2021). Users/workers perceive that the unpleasant sensation of technostress is generated by an imbalance between humans and the technological environment in which they perform their work (Abilleira et al., 2021).

Stress. Work stress, has been shown to cause decreased general well-being, psychological tension with increased anxiety and depression, and reduced cognitive abilities, such as concentration and productivity at work, along with increases in biological stress markers. The impact of digitalization can affect cognitive processes which are considered as psychological responses to prolonged stress and are usually expressed by negative emotions such as anxiety, depression, and anger. (Jukic et. al, 2020). A literature study Amankwah-Amoah et al. (2021) shows that productivity is undermined by employee stress caused by work intensification. Stress also increases in remote work environments, especially when social care activities are developed while working remotely and social isolation affects mental health (Pelaez et al., 2021). In addition, research shows that all four risk factors for digital work (distributed teamwork, mobile work, constant availability, and inefficient technical support) are associated with higher stress in the workplace (Bregenzer & Jimenez, 2021). Psycho-social risks in the workplace cannot be ignored, such as time pressure and difficulty in establishing good interpersonal exchanges at work as the main sources of stress for employees (Palumbo, 2021). The psychosocial demands of the sometimes unattainable impact of digitization on the part of employees constantly exceed their resources and coping capacities, this

can result in perceived stress and, as a long-term consequence, the development of mental disorders and somatic or psychosomatic illnesses (Schreibauer et. al, 2020).

Workload. Work overload is characterized by the need to work faster, the need for a faster response, reduced downtime, and the need to perform multiple tasks simultaneously. The permanent connection to the world of work as a result of new technologies increases the likelihood of extended workdays and excessive workloads, which affect the likelihood of achieving an adequate level of detachment (Sandoval-Reyes, et.al, 2019). Survey participants included social workers with 2,470 participants in the quantitative study reported having experienced an increased work-load resulting from the COVID-19 pandemic. One of the reasons for increased work-load was due to working longer hours. This study indicated they were very worried about the emotional impact on their well-being, such that they had increased work load with little additional compensation (Ashcroft et al., 2021).

Anxiety. As the COVID-19 pandemic has affected everyone, its impact is more negative on people whose jobs are not suitable for online work, private or self-employed employees, and low-income, low-educated and poor people, point out that most people have experienced increased anxiety and depression (Bozkurt, 2020). A quantitative study showed that perceived loneliness, psychological distress, technostress, and neuroticism were identified as strong psychological predictors of COVID-19 anxiety (Savolainen et al., 2021). In particular, the widespread use of digital tools and ICTs can dictate the extensification of work, which is conducive to irregular working hours and increased time pressure, thereby resulting in greater difficulties in dealing with work-related worries and concerns (Perrons et al., 2005).

Burnout. The blurring of boundaries between home and work life has increased stress. It has caused quite a lot and made employees burning-out. Some participants in a suevey study on social workers stated that ‘Having to be home to take care of my children and the various new stressors that COVID has presented has made me less competent, timely and responsive. It has caused a fair amount of distress and disengagement on my part that feels a little like “burn out”.’ (Ashcroft et al., 2021).

Fatigue. Fatigue is one of the effects of using technology in the workplace. This is described as an activation mechanism that lowers psychological arousal and can include feelings of fatigue (Graveling et. al., 2020). This effect has been found to be a major factor in burnout associated with switching to virtual care in social workers, the survey showed that employees experienced fatigue. One participant stated that they felt 'deep fatigue' another explained, 'I used to feel exhausted for years at work but worked with my Internet problem and subsequent distraction was fatigue' (Ashcroft et al., 2021).

Isolation. Isolation is a negative feeling or status. The effect of remote e-working is that when individuals feel stressed due to perceived loneliness and increased use of ICT technology, this may have an impact on their flow rate, a major positive mental experience associated with increased concentration at work (Ozkara, Ozmen, & Kim, 2016). Working virtually from home made many employees feel 'very isolated'. A survey study showed that many participants described feelings of deep stress. One participant described feeling 'demoralized' while the other was 'stressed out'. (Ashcroft et al., 2021). When the coercive circumstances of the pandemic and the proliferation of work from home are combined, loneliness appears to be an unavoidable consequence for employees of the resulting social isolation (Taser et al., 2021). Loneliness is defined as a subjective feeling of a lack of social relationships, whereas social isolation is accepted as an objective lack of social companionship, especially where the quantity of social contact

is important (Gierveld, Tilburg & Dykstra, 2006; Valtorta & Hanratty, 2012). Working exclusively remotely has been shown to have a negative impact on well-being in terms of workplace relationships and work-life balance (Juchnowicz & Kinowska, 2021).

In terms of age difference, the results of a quantitative study of the social and health implications of digital work intensification in cross-sectional data of 3180 participants (born 1959 and 1965) from a representative German lidA cohort study showed ICT use, per se, had no negative impact on older workers. Meanwhile, in terms of gender differences, the results confirmed that technostress was higher for women (Spagnoli et al., 2020). These results are consistent with previous evidence, where men are generally involved in more complex and technology-based tasks, while women have fewer opportunities to develop technology confidence (Brussevich et al., 2018). According to Morris, Venkatesh and Ackerman (2005) irrelevant gender differences in young employees and dimensions of certain types of technostress. Another recent study showed that there is a higher level of techno complexity and techno uncertainty in women, while men are more susceptible to techno overload and techno invasion (Marchiori, Mainardes & Rodrigues, 2019).

CONCLUSION AND SUGGESTION

It is clear from the papers identified and selected for inclusion in this review that the potential side effects of new technologies are only now being researched to some extent, although the underlying concept of 'technostress' is not new. Based on the research results, it can be identified adverse psychosocial effects on the well-being of employees affected by digitalization during the COVID-19 outbreak, including: technostress, work stress, work load, anxiety, burnout, fatigue and isolation. In terms of age difference there is no no negative impact on older workers in ICT use. Meanwhile, in terms of gender differences, the results confirmed that technostress was higher for women.

The form of digitization is a form where civilization no longer uses traditional things, in other words the community, especially employees, are required to be able to adapt, adapt their work needs to digitalization, and as much as possible minimize the negative impact. Like two blades, we know that not all digital developments that occur in this society bring badness, that there are also some people who have accepted or are even in the process of integrating with advanced technology in this current era.

The practical implications of the results of this meta-analysis, which can be used as input for employees and the wider community, are as follows; for employees who feel burdened by the impact of digitalization advances that should be able to become a supporting role for future work, can adapt by understanding modern technology and learn to manage the time when to work and rest so as not to experience the bad effects of digitalization. For people with digitalization in the modern era, this research is expected to broaden their horizons about the negative impacts of adopting digital technology. In addition, technological advances can facilitate all types of work, more precisely when working, so that work can be completed quickly and precisely, but still must be wise in its use.

This analysis is oriented towards work settings with the main objective of how digitization affects employee well-being, particularly in relation to work, and mental health. It is possible that further important information such as the effects of prolonged smartphone use for mobile work, physical effects and some psychosocial effects (such

as social isolation) could also be investigated in non-work situations, possibly increasing the scale of available data sources. While the results of this meta-analysis provide a meaningful explanation, they must be considered in light of the limitations of the study. A cross-sectional study, self-reported data, and a longitudinal study will provide meaningful research evidence and can have useful practical implications, and a larger collection including multiple sources will strengthen the results.

Moreover, future literature may also emphasize the role of situational factors, for example work context, in exacerbating the impact of digital technology adaptation on the well-being of employees who develop a particular behavior during and after the pandemic, which should be addressed in future studies. Future studies should explore how work engagement might show a similar relationship to technostress and how a positive psychological relationship with one's work might affect this situation. Whereas, engaged employees may also exhibit high levels of technostress, stemming from the blurred boundaries between work and work life due to the greater occurrence of remote work. In the future, research should also investigate the role of gender and age in relation to technology use and technostress in more detail.

REFERENCES

Abilleira, M., Rodicio-Garcia., M., Rios-de Deus., M., & Mosquera-Gonzales, M. (2021). Technostress in Spanish University teachers during the COVID-19 pandemic. *Frontiers in Psychology, 12*, 1-11. doi:10.3389/fpsyg.2021.617650.

Amankwah-Amoah, J., Khan, Z., Wood, G., & Knight, G. (2021). COVID-19 and digitalization: The great acceleration. *Journal of Business Research, 136*(2021), 602-611. doi:10.1016/j.jbusres.2021.08.011.

Ashcroft, R., Sur, D., Greenblatt, A., & Donahue, P. (2021). The impact of the COVID-19 pandemic on social workers at the frontline: A survey of Canadian social workers. *The British Journal of Social Work, July 2021*(bcab158), 1-23. doi: 10.1093/bjsw/bcab158.

Ayyagari R., Grover, V., & Purvis, R. (2011). Technostress: Technological antecedents and implications. *MIS Quarterly, 35*(4), 831-858. doi: 10.2307/41409963.

Barbuto, A., Gilliland, A., Peebles, R., Rossi, N., & Shrout, T. (2020). *Telecommuting: smarter workplaces*. Retrieved from: http://hdl.handle.net/1811/91648

Bordi, L., Okkonen, J., Mäkiniemi, J., & Heikkilä-Tammi, K. (2018). Communication in the digital work environment: Implications for wellbeing at work. *Nordic Journal of Working Life Studies, 8*(S3), 29-48. doi: 10.18291/njwls.v8is3.105275.

Borle, P., Boerner-Zobel, F., Voelter-Mahlknecht, S., Hasselhorn, H. M., & Ebener, M. (2021). The social and health implications of digital work intensification. Associations between exposure to information and communication technologies, health and work ability in different socio-economic strata. *International Archives of Occupational and Environmental Health*, *94*(3), 377–390. doi:10.1007/s00420-020-01588-5.

Bozkurt, V. (2020). Working during a pandemic: economic concerns, digitalization, and productivity. *The Covid-19 Pandemic and Its Economics, Social and Political Impacts* (pp. 87-106). Istanbul, Turkey: Istanbul University. doi: 10.26650/B/SS46.2020.006.07.

Bregenzer, A., & Jimenez, P. (2021). Risk factors and leadership in a digitalized working world and their effects on employees' stress and resources: Web-based

questionnaire study. *Journal of Medical Internet Research*, *23*(3). doi: 10.2196/24906.

Brussevich, M., Dabla-Norris, M. E., Kamunge, C., Karnane, P., Khalid, S., & Kochhar, M. K. (2018). *Gender, technology, and the future of work*. Washington, DC: International Monetary Fund.

Díaz, M. L., Cruz-Chávez, M. A., Juárez-Pérez, F., Enriquez-Urbano, J., Rivera-López, R., & Acosta-Flores, M. (2021). Optimization method to address psychosocial risks through adaptation of the multidimensional Knapsack Problem. *Mathematics*, 9,1-23.

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, *27*(8), 930–942. doi:10.1177/0146167201278002.

Dubosson, M., Fragniere, E., Junod, N., Meier, S. &. Varone, S. (2019). Digitized governance to mitigate human-related risks: A software based on overall early detection. *Proceedings of the 18th International Conference on Informatics in Economy. Education, Research and Business Technologies*, (pp. 229-234). doi: 10.12948/ie2019.04.13.

Galanti, T., Guidetti, G., Mazzei, E., Zappalà, S., & Toscano, F. (2021). Work from home during the COVID-19 outbreak: The impact on employees' remote work productivity, engagement, and stress. *Journal of Occupational and Environmental Medicine*, *63*(7), e426–e432. doi:10.1097/JOM.0000000000002236.

Gierveld, J.d., Tilburg, T. G., & Dykstra, P. A. (2006). Loneliness and social isolation. In A. Vangelisti, & D. Perlman (Eds.), *The Cambridge handbook of personal relationships* (pp. 485–500). Cambridge, UK: Cambridge University Press.

Goetz, T.M., & Boehm, S. A. (2020). Am I outdated? The role of strengths use support and friendship opportunities for coping with technological insecurity. *Computers in Human Behavior*, 107(2020), 106265. doi:10.1016/j.chb.2020.106265.

Johnson, J., Hall, L.H., Berzins, K., Baker, J., Melling, K., & Thompson, C. (2018). Mental healthcare staff well-being and burnout: A narrative review of trends, causes, implications, and recommendations for future interventions. *International Journal of Mental Health Nursing*, *27*(1), 20–32.

Juchnowicz, M., & Kinowska, H. (2021). Employee well-being and digital work during the COVID-19 Pandemic. *Information*, *12*(8), 1-13. doi:10.3390/info12080293.

Jukic, T., Ihan, A., Strojnik, V., Stubljar, D., & Starc, A. (2020). The efect of active occupational stress management on psychosocial and physiological wellbeing: a pilot study. *BMC Medical Informatics and Decision Making*, *20*(231), 1-8. doi:10.1186/s12911-020-01347-z.

Karani, A., & Mehta, S.A. (2021). "I am OK when you are with me" – Understanding the well-being and innovative behavior in the digitized workspace. *International Journal of Sociology and Social Policy*. Vol. ahead-of-print No. ahead-of-print. doi:10.1108/IJSSP-05-2021-0127.

Köffer, S. (2015). Designing the digital workplace of the future – what scholars recommend to practitioners. *Proceeding of Thirty Six International Conference on Information Systems-Exploring the Information Frontier*, Fort Worth, Texas, USA, December 13-16, 2015.

Marchiori, D. M., Mainardes, E. W., & Rodrigues, R. G. (2019). Do individual characteristics influence the types of technostress reported by workers?. *International Journal of Human Computer Interaction, 35*(3), 218–230. doi: 10.1080/10447318.2018.1449713.

Misselbrook, D. (2014). W is for Wellbeing and the WHO definition of health. *British Journal General Practice, 64*(628), 582.

Molino, M., Ingusci, E., Signore, F., Manuti, A., Giancaspro, M.L, Russo, V., Zito, M., & Cortese, C.G. (2020). Wellbeing costs of technology use during covid-19 remote working: an investigation using the Italian translation of the technostress creators scale. *Sustainability, 12*(15), 1-20. doi:10.3390/su12155911

Morris, M. G., Venkatesh, V., & Ackerman, P. L. (2005). Gender and age differences in employee decisions about new technology: an extension to the theory of planned behavior. *IEEE Transaction on Engineering Managamenet, 52*(1), 69–84. doi: 10.1109/TEM.2004.839967.

Ozkara, B. Y., Ozmen, M., & Kim, J. W. (2016). Exploring the relationship between information satisfaction and flow in the context of consumers' online search. *Computers in Human Behavior, 63*(2016), 844–859. doi:10.1016/j.chb.2016.06.038.

Palumbo, R. (2020). Let me go to the office! an investigation into the side effects of working from home on work-life balance. *International Journal of Public Sector Management, 33*(6/7), 771-790.

Palumbo, R. (2021). Curbing the drawbacks of digitization on psycho-social risks at work in educational institutions. Preliminary evidence from Europe. *Quality Assurance in Education, 29*(2/3), 84-100. doi: 10.1108/QAE-02-2021-0019.

Palumbo, R., Manna, R. & Cavallone, M. (2020). Beware of side effects on quality! investigating the implications of home working on work-life balance in educational services. *The TQM Journal, 33*(4), 915-929. doi:10.1108/TQM-05-2020-0120.

Pelaez, A.L., Erro-Garces, A., Garcia, F.J.V., & Kiriakou, D. (2021). Working in the 21st century. The coronavirus crisis: A driver of digitalisation, teleworking, and innovation, with unintended social consequences. *Information*, 12, 377. doi:0.3390/info12090377.

Perrons, D. (2005). The new economy and earnings inequality: Explaining social, spatial and gender divisions in the UK and London. *London School of Economics (LSE) Research Online Working Paper*, 17, 1-46.

Polents, I., Fedorova, A., & Zarubina, A. (2020). The impact of labour process digitalization on conditions and quality of work life. *The 14th International Days of Statistics and Economics* (pp. 845-854). Prague, Czech Republic. Retrieved from: https://msed.vse.cz/msed_2020/article/268-Polents-Ilona-paper.pdf

Ryff, C.D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol., 57*(6), 1069–1081.

Salanova, M., Llorens, S., & Cifre, E. (2013). The dark side of technologies: technostress among users of information and communication technologies. *Int. J. Psychol, 48*(3), 422–436. doi: 10.1080/00207594.2012.680460.

Sandoval-Reyes, J., Acosta-Prado, J. C., & Sanchís-Pedregosa, C. (2019). Relationship amongst technology use, work overload, and psychological detachment from work. *International Journal of Environmental Research and Public Health, 16*(23), 1-11. doi:10.3390/ijerph16234602.

Satpathy, S., Patel, G. & Kumar, K. (2021). Identifying and ranking techno-stressors among IT employees due to work from home arrangement during Covid-19 pandemic. *Decision*, *48*(4), 391-402. doi:10.1007/s40622-021-00295-5.

Savolainen, I., Oksa, R., Savela, N., Celuch, M., Oksanen, A. (2021). COVID-19 Anxiety—a longitudinal survey study of psychological and situational risks among Finnish workers. *International Journal of Environmental Research and Public Health*, *18*(2), 1-13. doi:10.3390/ijerph18020794.

Schreibauer, E., Hippler, M., Burgess, S., Rieger, M. A., & Rind, E. (2019). Work-related psychosocial stress in small and medium-sized enterprises: an integrative review. *International Journal of Environmental Research and Public Health*, *17*(20), 1-23. doi:10.3390/ijerph17207446.

Shu, Q., Tu, Q., & Wang, K. (2011). The impact of computer self-efficacy and technology dependence on computer-related technostress: A social cognitive theory perspective. *International Journal of Human-Computer Interaction*, *27*(10), 923–939. doi: 10.1080/10447318.2011.555313.

Spagnoli, P., Molino, M., Molinaro, D., Giancaspro, M.L., Manuti, A., & Ghislieri, C. (2020). Workaholism and technostress during the COVID-19 emergency: The crucial role of the leaders on remote working. *Front. Psychol*, 11, 1-9. doi: 10.3389/fpsyg.2020.620310.

Tarafdar, M., Tu, Q., Ragu-Nathan, B.S., & Ragu-Nathan, T.S. (2007). The impact of technostress on role stress and productivity. *Journal of Management Information System*, *24*(1), 301–328. doi:10.2753/MIS0742-1222240109.

Tarafdar, M., Tu, Q., & Ragu-Nathan, T. S. (2010). Impact of technostress on end-user satisfaction and performance. *Journal of Management Information System*, *27*(3), 303–334. doi: 10.2753/MIS0742-1222270311.

Thulin, E., Vilhelmson, B., & Johansson, M. (2020). New telework, time pressure, and time use control in everyday life. *Sustainability*, *11*(11), 1-17. doi: 10.3390/su11113067.

Taser, D., Aydin, E., Torgaloz., A., O., & Rofcanin, Y. (2022). An examination of remote e-working and flow experience: The role of technostress and loneliness. *Computers in Human Behaviour*. 1-10. doi:10.1016/j.chb.2021.107020.

Valtorta, N., & Hanratty, B. (2012). Loneliness, isolation and the health of older adults: Do we need a new research agenda?. *Journal of the Royal Society of Medicine*, *105*(12), 518–522. doi:10.1258/jrsm.2012.120128.

Vanhercke, B., Ghailani, D., & Sabato, S. (2018). *Social policy in the european union*: State of play 2018, (Nineteenth annual report) . Brussels: European Trade Union Institute (ETUI).

Weil, M., & Rosen, L. (2017) *Technostress: Coping with technology at work, home, and play.* USA: John Wiley & Sons Inc.

Zeike, S., Kyung-Eun, C., Lindert, L. & Pfaff, H. (2019). Managers' well-being in the digital era: is it associated with perceived choice overload and pressure from digitalization? an exploratory study. *International Journal of Environmental Research and Public Health*, *16*(10), 1-15. doi:10.3390/ijerph16101746.

Zhang, X., Wang, Y., Liu, X. & Xu, S. (2016). The relationship between interpersonal relationship and the subjective wellbeing of Chinese primary and secondary teachers: A mediated moderation model. *International Journal of Educational and Pedagogical Sciences*, *10*(5), 1472-1476.