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From Digital Divide to Technostress during the COVID-19 Pandemic: A Scoping Review

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Background and purpose: This paper relates challenges faced by older adult employees during the COVID-19 crisis in order to describe strategies to reduce the digital divide and technostress, thereby supporting inclusion and retention in the marketplace. Older adults are particularly at risk of Internet-related social exclusion, especially during the COVID-19 pandemic. The main research question of the current scoping review were: What kind of strategies can reduce the digital divide and technostress of older adult employees and contribute to their inclusion and retention in the working market during the COVID-19 pandemic?
Methodology: This review is based on the Arksey and O'Malley framework for scoping reviews. The six-stage framework includes: identifying research questions, identifying relevant studies, study selection, charting the data, summarizing and reporting the results, and a consultation exercise. A scoping review was conducted using five humanistic and social electronic databases - CINAHL with full text, EBSCO, Medline, SocIndex, Web of Science - and additionally hand-searches performed on Google Scholar. The search was limited to studies published from January 2020 to March 2021. After applying inclusion and exclusion criteria, 10 articles were included.
Results: This review shows that the most important strategies are: 1) ICT educational training courses; 2) social dialog; 3) building inclusive workplaces; 4) implementation of successful 'aging in public' policies. Our results are beneficial for individuals, organizations, industries and different societies by showing how concrete strategies can be implemented at multiple levels.
Conclusion: The study has found that one of the most effective strategies to reduce the digital divide faced by older adult employees during the COVID-19 crisis and technostress is social dialog between employers and employees, which can be a source of innovative and creative solutions (e.g. partnership programs or tailored support). Social dialog should include active cooperation with older adult workers - asking what they need and want - to enable skills development through training.

Keywords: COVID-19, Digital divide, Older adult, Employees, Technostress

1 Introduction

The COVID-19 pandemic turned the world of work upside down and is having a dramatic effect on the livelihoods and well-being of workers, their families, and businesses worldwide - particularly small and medium-sized enterprises (Kumar et al., 2021). Employees are required to distance themselves physically and socially, and public and private entities responded to this obligation by transferring their activities to cyberspace. According to Mazzucato & Kattel, (2020), COVID-19 brought to the fore long-

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held concerns regarding the digital economy: the lack of privacy and monopoly power of Big Tech, incapability of governments, and the digital divide between those with and without access. As a consequence, the digital skills of older adult employees around the world have been subjected to daily trials during the COVID 19 pandemic. Older adults are the fastest growing segment of the population, and the definition of "older person" varies from country to country. In this article we have adopted 60+ as a working age-category, consistent with the United Nations definition (2017) of older adults; however, this is not to convey that older adults are a homogenous group defined by a specific age, nor to challenge age as a fluid concept.

Technology use among older adults increased in tandem with the trends of increasing technology use in the general population (OECD, 2017). Older adults are particularly at risk of internet-related social exclusion, since they tend to use the Internet less than younger adults. Additionally, older adults use ICT the least and very often require educational support to be included in the information society (Seifert et al, 2018). According to Gell et al. (2015), older adults are on average less technology-literate than younger adults, adding to feelings of marginalization (Watson, 2018). Passarelli et al. (2016) defined digital exclusion as people at risk of being excluded from access and use of digital technologies. Schejter et. al. (2015) explained digital exclusion involves the unequal access and unequal capacity to use information and communication technologies (ICTs) that are seen as essential to fully participate in society. Van Dijk (2005) identifies a sequential relationship between social inequalities and unequal access to digital technologies. The definition of digital exclusion has changed in recent literature; positions based on a simple 'user/non-user' and internet 'have/have not' understanding have shifted to an exploration of the gradations of internet use and a 'skills divide' (Van Dijk, 2012). There is a relationship between digital exclusion and technostress, with technostress being both a cause and a consequence of digital exclusion. For example, older workers have adequate intellectual capacity, but are concerned about the use of ICT due to various previous events (e.g., failure to learn new software). This factor can block them and prevent them from entering the lifelong learning process. On the other hand, technostress may be a natural element when learning to use new hardware and software. Thus, it can be both an effect and a cause of digital exclusion. Maceviciute & Wilson (2018) described the levels of digital divide based on Van Dijk (2012) as follows: the first level of the digital divide includes physical and material access; the second level of digital divide consists of inequalities in a wide range of "digital skills" (Van Dijk, 2012, p. 67); and the highest, third level of the divide, relates to technology appropriation and use that can be measured in time and frequency, diversity and quality of used applications, and the benefits derived from the usage of technology.

Watson (2018) analyzes the exclusion and marginalization of older people with respect to technology and states that marginalization is a long-lasting and pervasive fact of society, although the use of technology can make older adults feel less marginalized by connecting them socially, such as through communication technologies. The digital divide is a noticeable and global problem presenting the inequality of access to, and use of, Information and Communication Technologies (ICT) between individuals, organizations, regions, and countries (Tomczyk et al., 2020). The challenges connected with the digital divide have become one of the types of social exclusion leading to new social divisions and stratification, economic diversification, loss of privacy, and information and computer crimes (Ziemba, 2019). Harris et al. (2021) explained that ICT users have been found to experience stress associated with their usage of ICT, recently termed 'technostress'. Technostress has been defined as the mental stress that employees experience from using ICT during their work; it is thought to be "caused by an inability to cope with the demands of organizational computer usage" (Tarafdar et al., 2010). The central role of human resources (HR) is driving operational and strategic success during the COVID-19 pandemic; for this role to be successful there is a need to expand understanding of the way work context influences employee behaviors and actions (Collings et al., 2021).

Therefore, this scoping review focuses on how the digital divide and technostress can be reduced and which strategies would contribute to inclusion and retention in the working market during the COVID-19 pandemic, to clarify present knowledge and identify further research. The aim of this scoping review is to relate challenges faced by older adult employees during the COVID-19 crisis in order to describe effective strategies to reduce digital divide and technostress, thereby supporting inclusion and retention in the working market. This review was guided by the following two sub-research questions:

'What kind of strategies can reduce the digital divide and technostress of older adult employees?'

'How can employers contribute to older employees' inclusion and retention in the working market during the COVID-19 pandemic?'

2 Methods and materials

Given that the research questions were exploratory in nature, a scoping review methodology was employed in line with Arksey, O'Malley, (2005), with the recommendations made by Levac et al. (2010). A scoping review is a type of systematic review and a useful methodology for providing actionable and relevant evidence efficiently when time or cost factors are important; it is used to clarify definitions and understand the conceptual boundaries of a research area (Peters et al., 2015, and Tricco et al., 2016).

The audit was carried out in accordance with the PRISMA[1] protocol, which sets minimum criteria for systematic reviews of high-quality scientific publications and increases the transparency of information (Moher et al., 2016).

The review included the five key phases of recommendations made by Arksey, O'Malley (2005) and Tricco et al. (2016): (1) identifying the research question; (2) identifying relevant studies; (3) study selection; (4) charting the data; and (5) collating, summarizing, and reporting the results; the optional 'consultation exercise' of the framework was not conducted. Moreover, as suggested by Levac et al. (2010), this review: a) used an interactive team approach to selecting and extracting studies; b) incorporated an essential numerical summary and a qualitative analysis of the contributions extracted; and c) identified the implication of the study findings for policy and practice. The inclusion and exclusion criteria were specified and documented, as described below.

2.1 Inclusion and exclusion criteria

Articles had to meet the following criteria to be included: be published research studies in academic journals, primarily focused on older adults as workers during the COVID-19 pandemic; the studies had to have taken place in a digital setting; the studies were written in the authors' languages - Arabic, Czech, Danish, English, German, Norwegian, Slovak, and Swedish; and, the peer-reviewed articles were published between January 2020 and March 2021.

Articles which only provided therapy for COVID-19, monographs, book chapters, research reports or meeting abstracts, letters to editors and data papers and duplications were excluded, in addition to articles making no mention of access telecommunications infrastructure or digital divide by older adults during the COVID-19 pandemic.

2.2 Search strategy

Our research team was composed of the three reviewers that signed this work. Through online meetings the team defined the broad research question to be addressed and the study protocol, including the identification of the search terms, databases to be searched, the inclusion and exclusion criteria and the methods to solve any disagreement among the reviewers.

In April 2021, an exhaustive search was carried out following a three-step strategy. Firstly, a systematic search process was conducted using five electronic databases: - CINAHL with full text, EBSCO, Medline, SocIndex, Web of Science - and hand-searches performed on Google Scholar. The search was limited to studies published from January 2020 to March 2021, ensuring the studies were relevant and up to date. The key search terms were developed through an iterative process as the reviewers became more familiar with the evidence base. Subject terms used in this search included combinations of 'covid*', 'new coronavirus', 'pandemic', 'sars-cov2', '2019-ncov', '2019 novel', 'coronavirus disease', 'young seniors', 'older adults employees', 'employment and workplac*', 'older adults workers', 'digital divide', 'access information technology', 'information communication technology',' 'ability to use the internet' 'access telecommunicat*' 'digital infrastructure*' 'digital literacy', 'digital exclusion', 'telework', 'digital work' and 'digital gap'. This initial search was proceeded by an analysis of the title, abstract and index terms of the retrieved papers. Secondly, an additional search using the finalized search terms was performed across all databases. Thirdly, hand-searching was conducted to identify studies not located in the main searches (Hopewell et al, 2007). This involved reviewing the reference lists from the screened studies.

The literature search was conducted separately by three of the authors of this review (A.S, M.M.N, M.T). The first author (A.S.) used two electronic databases: Web of Science core collection (restricted to Social Sciences areas) and EBSCO database (specifically, Psychological and Behavioral Sciences Collection). The other two authors (M.M.N., M.T.) conducted the search in three electronic databases: CINAHL with full text, Medline and SocIndex. All the authors performed hand-searches using Google Scholar.

2.3 Search Outcome

A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al. 2015) statement flowchart (Figure 1) was constructed to clearly outline how the included studies were selected. An evidence examination based on the title and abstract was performed for the selection of the studies (Moher et al., 2016). The first search into title, abstract and keywords resulted in 180 documents. Screening identified 92 papers, of which 64 were excluded because they did not meet the objective of the study from the perspective of the social sciences - 30 documents because of duplicates, and 34 that eluded the aim of our study. Additionally, 17 studies as a full text were excluded because the papers were not primarily focused on older adult employees or did not take place in a digital setting. Ultimately, 10 documents were selected for the scoping review. All the selected articles are written in English language, because the English is currently becoming the global "lingua franca" in research. Prior to finalizing which studies were included, 10 full-text papers were selected at random by three independent raters and

[1] PRISMA: see http://www.prisma-statement.org/

assessed for inclusion eligibility, according to the criteria. These raters were all authors of this paper. The independent raters coded the list of studies into three categories: relevant, uncertain, and irrelevant. When differences arose, resolution occurred through examination of the full text and a discussion between the three reviewers, until agreement was found. There was 96% agreement regarding the rating of relevance.

3 Results

The findings of the scoping review process are presented here. The purpose of this review was relating to challenges faced by older adult employees during the COVID-19 crisis. Below we will discuss these findings briefly.

Two of the studies used research methodology with different types of review, and two described a theoretical framework; two studies used mixed methods, two studies had qualitative methods and the final two used quantitative methods. All 10 articles included different parts of the world (Spain, Sweden, Poland, Israel, Korea and one collaboration between Australia & China). Two articles were from the USA and from the UK. Key information from the 10 articles is presented in Table 1.

4 Discussion

The aim of this systematic review was to examine the current state of knowledge and trends in the peer-reviewed literature. We abstracted four main categories of what kind of strategies can reduce the digital divide and technostress of older adult employees and contribute to their inclusion and retention in the working market during the COVID-19 pandemic. They are as follows:

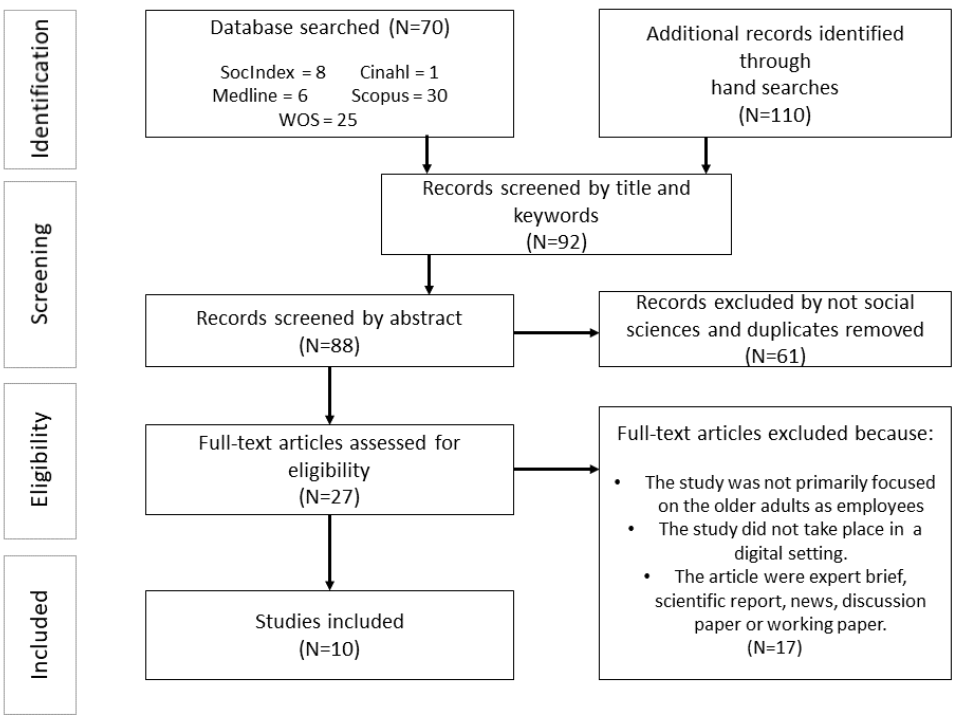


Figure 1: Flowdiagram

Table 1: Summary of studies included

	Source and Country	Study Type	Aims/Purpose	Findings	Recommendation for future research
1.	Monahan et al. (2020). COVID-19 and Ageism: How Positive and Negative Responses Impact Older Adults and Society USA	A theoretical study	This article explores positive and negative responses toward older adults during the COVID-19 pandemic and the expected short- and long-term consequences, such as impacting beliefs about and treatment of older adults, intergenerational relations, and individuals' mental and physical health.	Ageism during the pandemic negatively affects older adults' mental health as they face being devalued, viewed as a burden, and discriminated against. Ultimately, ageism influences how all age groups view their own ageing and older adults, how and whether they positively interact with older adults, and their career choices such as entering the geriatric workforce.	Older adults are vital, valuable contributors to society. Now is the time for research to detail the short and long-term consequences of positive and negative responses toward older adults during the pandemic and take swift policy action.
2.	Mazzucato, M. & Kattel, R. (2020). COVID-19 and public sector capacity UK	A theoretical study	The paper argues that to govern during a pandemic, governments require dynamic capabilities and capacity - which are too often missing. These include the capacity to adapt and learn; align public services and citizen needs; govern resilient production systems; and govern data and digital platforms.	The focus is on an international level, approached in a challenge-oriented or mission-oriented way. This approach could facilitate better coordination mechanisms that accelerate mutual learning and skills transfer. Such a framework could also encourage a higher level of coordination and cooperation between governments and encourage new investment in effective transnational governance mechanisms.	The research should focus on developing the dynamic capabilities of the public sector.

Table 1: Summary of studies included (continues)

3.	Esteban-Navarro et al. (2020). The Rural Digital Divide in the Face of the COVID-19 Pandemic in Europe -Recommendations from a Scoping Review Spain	A scoping review	This article identifies and analyzes the proposals made by academic literature to overcome the digital divide in the European rural world for the five-year period 2016–2020.	Three lines of action are proposed: the evaluation of national and regional public policies; the consideration of digital inclusion as a potential instrument to reduce rural depopulation; and training in advanced digital skills to improve the social communication processes, considered key to promoting empowerment and entrepreneurship.	Future researchers should focus on specific communities, while addressing connectivity and inclusion issues to support more personalized public policies.
4.	Sun et al. (2020). Factors Influencing Rumour Re-Spreading in a Public Health Crisis by the Middle-Aged and Elderly Populations China & Australia	A quantitative method (survey of 556 individuals)	This research helps the public to understand the rumour re-spreading behaviour of the middle-aged and elderly, which addresses the lack of literature in this area.	Middle-aged and older people demonstrate weakness in the areas of discrimination and media literacy and therefore easily become marginalized groups in the identification of rumours during pandemics.	The importance of increasing public knowledge expertise and of reducing public panic. This also has important implications for the future design of public health policies.
5.	Halvorsen, C. J & Yulikova O. (2020). Older Workers in the Time of COVID-19: The Senior Community Employment Program and Implications for Social Work USA	A review	The review relates to older workers and how they might be affected by this pandemic and its aftermath, paying particular attention to the most economically and physically vulnerable older workers, noting the uptick in technology use among older adults and the disparities that remain.	The conclusion has implications for program operators and gerontological social workers regarding technology use among financially vulnerable older adults, as well as social work scholarships and teaching methods that integrate concepts of cumulative disadvantage. It also calls for social work scholars to pursue additional collaborations with service providers for the aging and the older adults themselves.	Further plans include documenting the experiences of the Senior Community Service Employment Program (SCSEP) participants among a range of antecedents and outcomes at the individual, organizational, and community levels, as well as using participants' and case managers' own voices to shape program and policy recommendations to strengthen SCSEP.

Table 1: Summary of studies included (continues)

6.	Fischl et al. (2020). Tailoring to Support Digital Technology-Mediated Occupational Engagement for Older Adults - a Multiple Case Study Sweden	A qualitative method (nine cases with semi-structured interviews)	This study explores how tailoring support to enable older adults' engagement in digital technologies-mediated occupations could be schematized.	Findings focus on building relations and trust, and identify interests, needs, or goals in the close collaborative partnership between older adults and occupational therapists to achieve changes in occupational performance.	
7.	Tomczyk et al. (2020). Digital Inclusion from the Perspective of Teachers of Older Adults - Expectations, Experiences, Challenges and Supporting Measures Poland	A qualitative method (a structured in-depth interview with eight specialists - educators of older adults)	The aim of the study was to diagnose the needs of instructors working in the area of the digital inclusion of persons who are excluded, at risk of exclusion, marginalized, and discriminated against in terms of using new technologies.	The study is a significant contribution to the existing knowledge about the needs of people who work with the digitally excluded. The statements provided by the respondents are practical and result from their rich experience in working toward digital inclusion.	Further research could be oriented for other professions (social workers etc.)
8.	Nimrod, G. (2020). Technostress in a Hostile World: Older Internet Users Before and During the COVID-19 Pandemic Israel	A quantitative method (surveys with ICT users aged 60+ were conducted in 2016 (N=537) and during the COVID-19 pandemic of 2020 (N=407), examining technostress level, internet use patterns and sociodemographic background).	This study aimed at exploring individual and contextual antecedents to technostress (stress induced by Information and Communication Technology (ICT) use) among older ICT users.	The study suggests that internet use should not be perceived as panacea for constraining circumstances in later life - its use may add rather than alleviate stress. Practitioners should realize that different internet use may have varying impacts on different users, and should consider interventions to ease technostress among older adults and help them differentiate between adaptive and maladaptive uses.	Future studies should explore more diverse audiences, employ more accurate measures of media use and examine additional contextual antecedents, technostress inhibitors, types of content consumed, and attitudes and benefits gained from ICT use. Finally, intervention techniques and their efficacy in reduction of both technostress should be explored.

Table 1: Summary of studies included (continues)

9.	Lee et al. (2021). Can Older Workers Stay Productive? The Role of ICT Skills and Training Korea	A mixed method Different empirical techniques such as the inclusion of fixed effects and literacy skills scores and the adoption of regression imputation and IPW methods.	This paper quantitatively examines the effects of aging on labor productivity using individual worker data in Korea.	The results suggest that productivity decline due to the aging process can be mitigated by promoting training for older workers to equip them with adequate ICT skills, potentially giving a larger productivity than younger workers.	An important area for future research would be investigating the endogeneity issues in measuring the effects of aging on labor productivity, and the effects of ICT skills proficiency and job training on the labor productivity of older workers.
10.	Choudrie et al. (2021). Bridging the Digital Divide in Ethnic Minority Older Adults: An Organizational Qualitative Study UK	A mixed method	The study explores the digital divide in older adults when accepting and using smart devices within an organization.	The findings of this study suggest that bridging the digital divide leads to benefits for economies and societies. It implies that by using ICTs, older adults can remain independent, active and work for longer, leading to less pressure on public services, e.g. the social services sector. When the older adult belongs to an ethnic minority the impetus is even greater since their status and cultural differences also set them apart.	Future studies should focus on other smart devices, possibly concentrating on identifying the requirements of different cultural groups and the outcomes stemming from such cross-cultural differences.

4.1 ICT educational training courses as a part of human resources management

The articles described the deep digital divides that became apparent during the COVID-19 lockdown, and suggested which measures, interventions and services could be provided or offered. Human resource (HR) managers have been central to the response in organizations globally. Employees overcame many challenges during the COVID-19 pandemic and HR managers made decisions and devised strategies to manage their workforces. The pandemic revealed deep labor market and workplace inequalities linked to the widespread commodification of labor. The policies causing these inequities were often implemented by HR professionals and, in some cases, followed theories and concepts prepared and taught by HR academics (Butterick and Charlwood, 2021). Employers need to carefully manage the trade-offs between external conditions, such as the COVID-19 pandemic restrictions, and internal conditions such as the flexibilities and abilities of employees.

There are three aspects of resources able to reduce technostress and digital divide: a) digital resources (material made available online); b) human resources (in particular, literacy and education) and c) social resources (the community, institutional and societal structures that support access to IT) (Choudrie et al., 2021). ICT education and training during COVID-19 has taken center stage due to the demand. Based on the studies, ICT skills attainment positively affects the wages of the older workers aged 50–64 with a higher level of education, or in a skill-intensive occupation (Lee et al., 2021). Additionally, Esteban-Navarro et al. (2020) pointed out that obstacles

to the adoption and use of technologies arising from the existence of a lower than average level of education and computer skills in rural areas, rather than urban ones, were proven. HR employees need to consider these facts. Job training also has a significant positive impact on the wages of older workers (Lee et al., 2021, and Rolandi et al., 2020). Compared to younger workers, older and well-educated ones can be more productive through higher ICT skills attainment and job-training participation. The evidence suggests that a productivity decline in line with the aging process can be alleviated by training aging workers to equip themselves with ICT skills. Also, Nimrod (2020) emphasized that managers, e.g., HR personnel, should consider interventions that would ease technostress among older adults and help them differentiate between adaptive and maladaptive uses.

As the studies conducted by Butterick and Charlwood (2021), Lee et al. (2021), Esteban-Navarro et al. (2020), Rolandi et al. (2020) and Nimrod (2020) showed, the employer's interventions are crucial, including educational training courses, individual attitudes and skills, and mutual learning and skills transfer as a part of HR management. It is essential to study the distributional and welfare consequences of evolving approaches to managing people and organizing employment at multiple levels of inquiry.

4.2 Social dialog - a way to achieve a socio-economic optimum

Labor market exposure is driven by a mixture of factors, including: a country's economic specialization; the cost considerations for incorporating automation into their supply chains; the supply, cost, and skills availability in the labor force; and access to and the adoption of technologies. The quality of foundational education influences the capabilities of adults for adaptation, cost and quality of ICT connectivity, the prevalence of jobs incorporating digital exposure, and opportunities for lifelong learning.

Furthermore Fischl et al. (2020)), pointed out that a collaborative approach was used in tailoring discussions about goals and alternative solutions that supported older adults, enabling the adults to make informed choices relevant to their desired occupations. Tailoring also meant that the interventions implemented were individualized to fit the participants' needs and the context. Digital skills are essential for sustainable competitiveness, resilience and ensuring social equity. Enterprises need workers with the skills required to master the green and digital transitions, and people need to be able to get the proper education and training to thrive. Skills enable businesses to remain competitive, while ensuring social fairness for all. Accordingly, we argue that peer-trained programs or tailored support and education are critical for social dialog as lifelong education. As the studies show, the coronavirus crisis has highlighted the significance of having the right skills for strategic sectors to perform and for people to navigate through life and achieve professional transitions. It has emphasized the need for digital skills in several aspects of people's daily lives and for business continuation. While telework and distance learning has become a reality for millions of people in the EU, our current digital preparedness limitations were often revealed. An increase in older workers may hinder economic growth if the older workers are less productive than the younger ones due to the deterioration of their physical and cognitive abilities and the low tendency to adapt to new technologies. Sustaining the productivity of older workers is not an easy task; yet, if older workers are more educated and continue to improve their human capital through their job training, work experience, and acquisition of new skills after their formal education, they can stay productive (Lee at al., 2021). According to Lee et al. (2021), regarding participation in job training, the distance to the training center and availability of training facilities might be possible factors. And Nimrod (2020) reported that health rather than age plays a significant role in an older adult's ability to cope with the stress resulting from ICT use in adverse circumstances.

Building digital skills and capabilities is also possible through social dialog with peer-to-peer help. Halvorsen & Yulikova (2020) described how a team of two participants contacted their peers through the Senior Community Employment Program (SCSEP) to help them learn how to use Zoom and other technologies to stay connected. To support inclusion and retention in the working market older adult employees should have the opportunity to be (re-)trained and build digital skills and capabilities that help them cope with the any uncertainty during the transition to technological competence.

4.3 Building inclusive workplaces

The articles suggest that working conditions relate to the creation and implementation of work environments that facilitate attraction, engagement, and retention of staff. Building inclusive workplaces, where older adults will not feel technostressed and will maintain their job positions during any crisis, is related to this.

As Mannheim et al. (2019) note, there seems to be a discrepancy between the digital technologies that have been developed and the wants and needs of older adults. The priority is to recognize the needs of older adults in the context of ICT, and then design appropriate programs and professional education. Despite the potential of technology to improve many areas of older adult lives, this population has yet to fully benefit from technology, given their information and communication technology use is proportionately lower than in younger segments of the population. Indeed, some older adults are more likely than others

to adopt and benefit from ICT use, but the factors contributing to these individual differences in ICT use are not well understood. Telework may lead to what a technical report by the European Commission has characterized in May 2020 as a new digital divide, depending on the type of settlement. Only 29% of workers living in the rural world have accessed telework compared to 44% of those living in large cities and 35% in the suburbs during the pandemic (Esteban-Navarro et al., 2020). It is unknown how the pandemic will influence our future lifestyle and when and if we can resume our regular lives. This pervasive uncertainty makes it hard to plan and thus generates additional psychosocial stress (Vinkers, 2020). The implementation of HR management as a basic precondition for managing changes caused by external conditions must also be a part of building inclusive jobs.

Further, creating special programs for older employees in the framework of building inclusive workplaces is seen as one of the important strategies. Such temporary or short-term programs help, for example, to reintegrate participants in the workplace, whether that be a return to the physical workplace or remote work when possible (Halvorsen & Yulikova, 2020). Another of the assumed conditions for building and implementing inclusive workplaces is a targeted facilitation, support, and collaborative process. Esteban-Navarro et al. (2020) stressed the importance of a close collaborative partnership between older adults and occupational therapists as a part of HR management, to achieve changes in occupational performance. They also noted that goal setting took time and that older adults should be given time to identify and, if necessary, modify goals. However, Nimrod (2020) underlined that external pressure to adopt technologies or make more intense use of them could increase technostress levels. HR management should remember that it is important to trust the competence of occupational therapists for enabling older adults to increase their abilities and reduce stress from learning.

4.4 Implementation of successful aging in public policy documents

The included articles pointed out that one of the strategies to contribute to the inclusion and retention of the working market - not only during the COVID-19 pandemic - is an upgrade of public policies, with the focus on successful aging in the society.

As Monahan et al. (2020) pointed out, the COVID-19 pandemic has perpetuated agism, highlighting the need for swift policy action to remedy the effects and address the roots of agism. Raising public awareness of institutionalized agism in health care, the workplace, and other settings is a crucial starting point. This can be achieved by two interrelated factors essential to agism reduction: (a) providing education about aging; and (b) positive intergenerational contact experiences. While some sectors and industries successfully moved online, millions of workers have lost their livelihoods and many more – especially women who are concentrated in very exposed sectors – remain at risk. The employment policies must address potential age discrimination in the application of furloughs, reduced pay, layoffs, rehiring, and retirement, as the pandemic has already resulted in enormous job losses (Coibion et al., 2020).

The public authorities are compelled to design policies, make decisions, decrease public panic, and implement urgent and quickly effective measures that minimize digital gaps of any kind, including those of territorial origin, especially in the rural areas. If such work is not carried out, there would be an inequality of citizens and territories in their participation in the information and knowledge society (Esteban-Navarro et al., 2020; Sun et al., 2020).

COVID-19 employment policies need to address the continuity of all workers' employment, including potential barriers for older adults, such as their ability to telework given the nature of their job, as well as enforcing safety protections in the physical workplace to meet health guidelines (e.g., erecting barriers, providing protective gear, implementing adequate cleaning) (Monahan et al., 2020). Attention toward sustainable development goals has become more urgent, and they must guide the research being conducted in various fields. As our findings show, aging is not a single stage concept; there are a lot of theories about successful aging but there is no definitive answer. The most important point is to remain active in the working market, if possible, without being a victim of the digital divide and technostress.

In summary, the digital divide and technostress can be reduced with different strategies such as ICT education, social dialogue, building inclusive workplaces and the implementation of successful aging in public policies. Technologies place larger demands on all age categories, as well as changes in the way human resources are managed during the crisis. HR managers' efforts and attitudes are vital in reducing the digital divide and technostress for older adult employees for the next period, as is continually developing ICT and implementing policies to aid the involvement of the older generation. As technology continues to evolve and people age, it is necessary to keep the digital divide to a minimum and to ensure inclusion and sustainable development in the labor market.

5 Limitations and Strengths of the Scoping Review Approach

This scoping review has several limitations and strengths. The two main limitations are that, firstly, this review may not have identified all articles in the published

and gray literature, despite attempts to be as comprehensive as possible. The three reviewers used their judgment to determine whether each review sufficiently met our study definition of a scoping review. The second main limitation is that our search algorithm included 23 different terms used to describe our topic; however, other terms may also exist. Although our search included databases (i.e., CINAHL with full text, EBSCO, Medline, SocIndex, Web of Science) and Google Scholar, the overall search strategy may have been biased toward humanistic and social sciences. Searching other bibliographic databases may have yielded additional published original articles or reviews. While our review included any article published in Arabic, Czech, Danish, English, German, Norwegian, Slovak, or Swedish, we inputted only English terms in the search engines. The studies we finally included were published in English only.

Nevertheless, several strengths remain. Firstly, the study considered worldwide literature linked to the digital divide and technostress, focusing on older adult employees during the COVID-19 pandemic. In order to capture the wider available and relevant literature, we considered articles written in languages other than English. Secondly, it additionally considered the influence of the COVID-19 pandemic in the working market specifically to challenges in connection with digitalization.

6 Implication for Future Research and Practice

We consider that future studies should focus on ICT educational training courses for older adults and identifying the requirements of different cultural groups and the results of these intercultural differences. Furthermore, we suggest that the direction of further study should be a more detailed focus on the possibilities of ICT educational training courses, a comparison involving minority groups, and identifying the causes of the digital divide and ways to bridge them.

7 Conclusion

The goal of this study was related to challenges faced by older adult employees during the COVID-19 crisis, to propose effective strategies to reduce digital divide and technostress, and to support inclusion and retention in the working market. Social dialog is a way to achieve a socio-economic optimum through an effective means for identifying specific challenges and needs (e. g. ICT educational training courses such as: e-learning platforms, tutorials, workplace safety, free training classes or job training), reducing the digital divide and technostress. Furthermore, social dialog between employers and employees can also be a source of innovative and creative solutions (e. g. peer-trained programs or tailored support). Active cooperation with older adult employees - by asking what they need and want - to enable the development of skills through educational training should be a part of social dialog.

The lockdown during the pandemic has made more evident the importance of sustainable development goals. There are two needs; firstly, the creation and retention of jobs - as well as building an inclusive workplace - requires balancing investment in skills and technology and promoting a shift towards a more human-centered and inclusive digitalization; and secondly, a comprehensive and concerted effort involving all stakeholders to foster an inclusive and diverse workforce, implementing policy documents which focus on successfully aging.

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Literature

Arksey, H., & O’Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32. https://doi.org/10.1080/1364557032000119616

Butterick, M., & Charlwood, A. (2021). HRM and the COVID-19 pandemic: How can we stop making a bad situation worse? *Human Resource Management Journal*, *31*(4), 847–856. https://doi.org/10.1111/1748-8583.12344

Coibion, O., Gorodnichenko, Y., & Weber, M. (2020). Labor markets during the COVID-19 crisis: A preliminary view (No. w27017). Cambridge, MA: National Bureau of Economic Research

Collings, D. G., McMackin, J., Nyberg, A. J., & Wright, P. M. (2021). Strategic Human Resource Management and COVID-19: Emerging Challenges and Research Opportunities. *Journal of Management Studies*, *58*(5), 1378–1382. https://doi.org/10.1111/joms.12695

Esteban-Navarro, M.-Á., García-Madurga, M.-Á., Morte-Nadal, T., & Nogales-Bocio, A.-I. (2020). The Rural Digital Divide in the Face of the COVID-19 Pandemic in Europe—Recommendations from a Scoping Review. *Informatics*, *7*(4), 54. https://doi.org/10.3390/informatics7040054

Fischl, C., Blusi, M., Lindgren, H., & Nilsson, I. (2020). Tailoring to support digital technology-mediated occupational engagement for older adults – a multiple case study. *Scandinavian Journal of Occupational Therapy*, *27*(8), 577–590. https://doi.org/10.1080/11038128.202

0.1760347

Gell, N. M., Rosenberg, D. E., Demiris, G., LaCroix, A. Z., & Patel, K. V. (2015). Patterns of Technology Use Among Older Adults With and Without Disabilities. *The Gerontologist*, *55*(3), 412–421. https://doi.org/10.1093/geront/gnt166

Halvorsen, C. J., & Yulikova, O. (2020). Older Workers in the Time of COVID-19: The Senior Community Service Employment Program and Implications for Social Work. *Journal of Gerontological Social Work*, *63*(6–7), 530–541. https://doi.org/10.1080/01634372.2020.1774832

Harris, K. J., Harris, R. B., Valle, M., Carlson, J., Carlson, D. S., Zivnuska, S., & Wiley, B. (2022). Technostress and the entitled employee: Impacts on work and family. *Information Technology & People*, *35*(3), 1073–1095. https://doi.org/10.1108/ITP-07-2019-0348

Hopewell, S., Clarke, M. J., Lefebvre, C., & Scherer, R. W. (2007). Handsearching versus electronic searching to identify reports of randomized trials. *Cochrane Database of Systematic Reviews*, *2010*(1). https://doi.org/10.1002/14651858.MR000001.pub2

Choudrie, J., Zamani, E. & Obuekwe, C. Bridging the Digital Divide in Ethnic Minority Older Adults: an Organisational Qualitative Study. Inf Syst Front (2021). https://doi.org/10.1007/s10796-021-10126-8

Kumar, A., Singh, R., Kaur, J., Pandey, S., Sharma, V., Thakur, L., Sati, S., Mani, S., Asthana, S., Sharma, T. K., Chaudhuri, S., Bhattacharyya, S., & Kumar, N. (2021). Wuhan to World: The COVID-19 Pandemic. *Frontiers in Cellular and Infection Microbiology*, *11*, 596201. https://doi.org/10.3389/fcimb.2021.596201

Lee, J.-W., Kwak, D. W. & Song, E. (2021). "Can older workers stay productive? The role of ICT skills and training," CAMA Working Papers 2021-04, Centre for Applied Macroeconomic Analysis, Crawford School of Public Policy, The Australian National University.

Levac D., Colquhoun H., O'Brien KK. (2010). Scoping studies: Advancing the methodology. *Implement Sci*. 5(1):69. https://doi.org/10.1186/1748-5908-5-69

Mannheim, I., Schwartz, E., Xi, W., Buttigieg, S. C., McDonnell-Naughton, M., Wouters, E., & van Zaalen, Y. (2019). Inclusion of Older Adults in the Research and Design of Digital Technology. *International Journal of Environmental Research and Public Health*, 16(19), 3718.

Maceviciute, E., & Wilson, T. D. (2018). Digital means for reducing digital inequality: Literature review. *Informing Science: the International Journal of an Emerging Transdiscipline*, 21, 269-287. https://doi.org/10.28945/4117

Mazzucato, M., & Kattel, R. (2020). COVID-19 and public-sector capacity. *Oxford Review of Economic Policy*, *36*(Supplement_1), S256–S269. https://doi.org/10.1093/oxrep/graa031

Monahan, C., Macdonald, J., Lytle, A., Apriceno, M., & Levy, S. R. (2020). COVID-19 and ageism: How positive and negative responses impact older adults and society. *The American Psychologist*, *75*(7), 887–896. https://doi.org/10.1037/amp0000699

Moher D., Shamseer L., Clarke M., Ghersi D., Liberati A., Petticrew M., Shekelle P., Stewart LA. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement. *Syst Rev 2015*; 4(1):1. https://doi.org/10.1186/2046-4053-4-1

Nimrod, G. (2020). Technostress in a hostile world: Older internet users before and during the COVID-19 pandemic. *Aging & Mental Health*, *26*(3), 526–533. https://doi.org/10.1080/13607863.2020.1861213

OECD. (2017). *Technology and innovation in the insurance_sector*._48_p. https://www.oecd.org/pensions/Technology-and-innovation-in-the-insurance-sector.pdf

Passarelli, B., Straubhaar, J., & Cuevas-Cerveró, A. (Eds.). (2016). *Handbook of Research on Comparative Approaches to the Digital Age Revolution in Europe and the Americas*. IGI Global. https://doi.org/10.4018/978-1-4666-8740-0

Peters, M. D. J., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *International Journal of Evidence-Based Healthcare*, *13*(3), 141–146. https://doi.org/10.1097/XEB.0000000000000050

Rolandi, E., Vaccaro, R., Abbondanza, S., Casanova, G., Pettinato, L., Colombo, M. and Guaita, A. (2020), Loneliness and social engagement in older adults based in Lombardy during COVID-19 lockdown: The long-term effects of social networking sites training course. *Alzheimer's Dement.,* 16: e047562. https://doi.org/10.1002/alz.047562

Seifert, A., Hofer, M., & Rössel, J. (2018). Older adults' perceived sense of social exclusion from the digital world. *Educational Gerontology*, *44*(12), 775–785. https://doi.org/10.1080/03601277.2019.1574415

Schejter, A., Ben Harush, O.R. and Tirosh, N. (2015). Re-theorizing the "digital divide": Identifying dimensions of social exclusion in contemporary media technologies. Available from https://eprints.qut.edu.au/86701/

Sun, Z., Cheng, X., Zhang, R., & Yang, B. (2020). Factors Influencing Rumour Re-Spreading in a Public Health Crisis by the Middle-Aged and Elderly Populations. *International Journal of Environmental Research and Public Health*, *17*(18), 6542. https://doi.org/10.3390/ijerph17186542

Sun, Z., Cheng, X., Zhang, R., & Yang, B. (2020). Factors Influencing Rumour Re-Spreading in a Public Health Crisis by the Middle-Aged and Elderly Populations. *International Journal of Environmental Research and Public Health*, *17*(18), 6542. https://doi.org/10.3390/

ijerph17186542
Tarafdar, M., Tu, Q., & Ragu-Nathan, T. S. (2010). Impact of Technostress on End-User Satisfaction and Performance. *Journal of Management Information Systems*, *27*(3), 303–334. https://doi.org/10.2753/MIS0742-1222270311
Tomczyk, Ł., Mróz, A., Potyrała, K., & Wnęk-Gozdek, J. (2022). Digital inclusion from the perspective of teachers of older adults—Expectations, experiences, challenges and supporting measures. *Gerontology & Geriatrics Education*, *43*(1), 132–147. https://doi.org/10.1080/02701960.2020.1824913
Tricco, A.C., Lillie, E., Zarin, W. et al. A scoping review on the conduct and reporting of scoping reviews. *BMC Med Res Methodol* 16, 15 (2016). https://doi.org/10.1186/s12874-016-0116
Van Dijk, J. A. G. M. (2012). The Evolution of the Digital Divide - The Digital Divide Turns to Inequality of Skills and Usage. In J. Bus, M. Crompton, M. Hildebrandt, & G. Metakides (Eds.), *Digital Enlightenment Yearbook 2012* (pp. 57-78). IOS Press.
United Nations. (2017). *World Population Ageing 2017 - Highlights*. Department of Economic and Social Affairs, Population Division. (ST/ESA/SER.A/397). https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Highlights.pdf
Van Dijk, J. A. G. M. (2005). The deepening divide: inequality in the information society. Thousand Oaks, Calif: Sage Pub. ISBN 978-1-4129-0402-5. HM851 .D55 2005
Van Dijk, J. A. G. M. (2012). The evolution of the digital divide: The digital divide turns to inequality of skills and usage. In J. Bus, M. Crompton, M. Hildebrandt, & G. Metakides (Eds), *Digital Enlightenment Yearbook*, 2012 (pp. 57-75). Amsterdam: IOS Press
Vinkers, C. H., Amelsvoort, R.C., Bison, J. I., Branchi, I., Cryan, J. F., Domschke, K., Howes, O. D. Manchia, M., Pinto, L., Quervai, de D., Schmidt, M. V. & Wee van der. N.J. A. (2020). Stress resilience during the coronavirus pandemic. European Neuropsychopharmacology. 35, 12-16. https://doi.org/10.1016/j.euroneuro.2020.05.003
Watson, K. (2018). "Technology and the Marginalization of Older Adults: How Politeness Theory and Stereotype Embodiment Interact in Older Adults' Technology Use" (2018). Honors Projects. https://scholarworks.bgsu.edu/honorsprojects/360
Ziemba, E. (2019). The contribution of ICT adoption to sustainability: Households' perspective. *Information Technology & People*, *32*(3), 731–753. https://doi.org/10.1108/ITP-02-2018-0090

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