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Employers' interventions to support older workers in the adaptation of digitalisation: a scoping review

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Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 December 2024 and was last updated on 8 December 2024.

INTRODUCTION

Review question / Objective This scoping review is focused workplace age inequalities and skills needed by older workers and on employer interventions to support the adaptation of workplace digitalisation. Digitalisation and the emergence of new technologies, in particular 5G, are expected to significantly impact and transform 20 million jobs across Europe, many of them in sectors with older workforces, such as manufacturing, transport and healthcare (Accenture Strategy, 2022). The 2018 Future of Jobs report published by the World Economic Forum emphasises that at least 54% of current workers will need to upskill or reskill. The process of digitalisation and the emergence of autonomous intelligent systems are creating a radical change in the labour and labour market, causing job inequalities (Kolade & Owoseni, 2022).This is also leading to age inequalities in which older workers who lack the skills to adapt to changing technology are at risk of being pushed out of the job market. The aim of this scoping review therefore is to consolidate evidence on employer interventions to support older workers in the adaptation of digitalisation to stay economically active

The research questions are:

1. How does digitalisation contribute to workplace age inequalities for older workers?
2. What skills do older workers need to stay in work within the context of digitalisation?
3. How are employers responding to workplace age inequalities for older workers caused by digitalisation through training, career development and other HRM interventions?

Rationale Pension ages are rising across Europe and employers need to find ways to both support older workers in not only delaying retirement but also staying productive in work (Oecd, 2020). Older workers are perceived as being resistant to change and reluctant to train (McNair, 2010). Lagacé et al. (2016) highlight that older workers may experience feelings of marginalization and dissatisfaction due to perceived inability to keep pace with rapid technological advancements. This disengagement can lead to psychological distress and a sense of exclusion from the workplace, ultimately affecting job satisfaction and productivity. However, there is a wealth of evidence that older workers embrace opportunities to take on new challenges, especially if they result in the acquisition of new skill and work is tailored to their capabilities, aspirations and work-life needs (Davies et al., 2017). Furthermore, Porubčinová (2020) emphasizes that facilitating conditions, such as support for digital learning, are crucial for older workers' successful technology adoption, suggesting that without adequate training and resources, older employees may struggle to adapt.

The impact of digitalization on older workers is not uniform; it varies significantly across different countries and cultural contexts. Komp-Leukkunen et al. (2022) argue that governmental programs aimed at enhancing digital skills among older workers can mitigate the adverse effects of digitalization. For instance, countries that invest in training programs for older employees tend to see better integration of these workers into the digital workplace. Conversely, in environments lacking such support, older workers may face increased job insecurity and reduced competitiveness in the labour market (Komp-Leukkunen, 2023; Meng et al., 2022). This disparity in support systems underscores the importance of policy frameworks that address the unique needs of older workers in the context of digital transformation. Moreover, the shift towards digitalization has implications for the career trajectories of older workers. Rantanen and Komp-Leukkunen (2023) discuss how the project-based nature of modern work demands continuous skill updates, which can be particularly challenging for older employees who may have fewer years left in the workforce to benefit from new skills (Rantanen & Komp-Leukkunen, 2023). This situation can lead to earlier retirements or forced transitions into less desirable roles, creating new social inequalities within the labor market. Additionally, Lakomý's (2023) research indicates that the pressures of digitalization can influence retirement decision-making, with older workers feeling compelled to retire earlier due to the stress associated with adapting to new technologies.

The psychosocial aspects of digitalization also play a significant role in shaping older workers' experiences. von Humboldt et al. (2023) explore how perceptions of older workers' adaptability and effectiveness can vary based on age-related biases and workplace culture. Age discrimination can exacerbate feelings of inadequacy among older employees, further entrenching workplace inequalities. As organizations increasingly rely on digital tools, the perception that older workers are less adaptable can lead to their marginalization, limiting their opportunities for advancement and engagement in meaningful work. There are therefore both a theoretical and practical need for consolidating evidence on where age inequalities exist in terms of digital technology in work; what skills and capabilities older workers need to maintain employment; and how employers are supporting older workers in adopting new technology in work.

Condition being studied This scoping review explores literature in journals focused on human resource management, public and social policy, gerontology, and sociology. Its focus is on employer interventions to support older workers (defined as 50 years and older) in the adaptation of new technologies in work. Interventions include but are not limited to training, on-the-job learning, job rotation, mentoring, ergonomic changes, and working hours adaptations. Although the primary focus of the review is on employer interventions, we are also reviewing studies concerning interventions delivered by government, trade unions and third sector organisations if the interventions concern employability and the target beneficiaries include older workers.

METHODS

Search strategy To draw together literature on older workers, digitalisation and interventions to support them in both adopting new technologies and staying economically active, we are conducting a data extraction performing three searches. All three searches were carried out with Scopus, Web of Science, PubMed. Searches were limited to publications published from 2019 to 2024 (March). We have included peer-reviewed journals and peer reviewed book chapters but excluded full books, conference papers, theses and grey literature. Where non-English studies were included, we sought two native language speakers to review the publications. Searches were of titles, keywords and abstracts.:

a) To draw literature on employer interventions for older workers, we ran a search with three sets of terms: those concerning digitalisation and its

effects (including, for example, technostress); those concerning older people (including but not exclusive to workers); and employers:
TITLE-ABS-KEY
((digital* OR "artificial intelligence" OR robot* OR automati*ation OR computeri*ed OR “new technology” OR “technological development” OR “AI”)
AND
("age inequalit*" OR "age discrimination" OR ageism OR ageist OR "age diversity" OR "age friendly" OR "age inclusive" OR retire* OR pension* OR "older adult*" OR "older person*" OR "older people" OR "senior person*" OR elder* OR "aged person*" OR "age*diverse" OR multigeneration* OR “multi-generation*” OR intergeneration* OR “inter-generation*”)
This yielded 1630 publications initially extracted
AND
("human resource management" OR "HRM" OR “HRD” OR “HR” OR "diversity management" OR "organi*ational behavio*r" OR "work* management" OR "performance management" OR career* OR "labo*r market" OR employment OR employee* OR employer* OR "organi*ations" OR organi*ational OR workplace OR "worker*" OR "workforce" OR "work force" OR “job” OR unemploy*))
b) In addition to employer-initiated interventions, we wanted to capture studies which concerned digitalisation and work but may involve deliverers who are not employers (e.g. government, charities or trade unions). However, we wanted to exclude studies on interventions to support the adoption of digitalisation which either did not concern older workers or did not concern employment. Therefore, we ran a second search. This one contained the same search terms for digitalisation but excluded terms for employers/human resource management. We restricted the definition of older people to older workers in order to exclude non-work related interventions. In order to capture studies concerning atypical workers, we have included terms for workers in non-standard employment (e.g. portfoloio, casual, self-employment).:
((digital* OR "artificial intelligence" OR robot* OR automati*ation OR computeri*ed OR “new technology” OR “technological development” OR “AI”) AND ("older worker*" OR "older employee*" OR "older workforce" OR "aged worker*" OR "aged employee*" OR "aged workforce" OR "mature worker*" OR "mature employee*" OR "mature workforce" OR "age-management" OR (older AND self-employ*) OR (older AND portfolio AND worker) OR (older AND casual AND worker)))
This yielded 129 publications in addition to the (a) search.

c) Finally, we sought publications specifically concerning workplace learning interventions. As with b, we sought studies on interventions delivered by employers and other stakeholders:
TITLE-ABS-KEY ((digital* OR "artificial intelligence" OR robot* OR automati*ation OR computeri*ed OR “new technology” OR “technological development” OR “AI”)
AND
("age diversity" OR "age*friendly" OR "age*inclusive" OR "older worker*" OR "older employee*" OR "older workforce" OR "aged worker*" OR "aged employee*" OR "aged workforce" OR "mature worker*" OR "mature employee*" OR "mature workforce" OR "ag*ing workforce" OR "ag*ing labo*r market")
AND
(education* OR skill* OR learning OR training OR "professional development" OR “human resource development” OR “HRD” OR mentor* OR apprentice* OR recruitment OR unemploy* OR competence))
This search yielded 94 additional publications.

Participant or population This scoping review concerned interventions to support older workers (both those in permanent employment and those with atypical work patterns including portfolio and casual work) in the adoption of digitalisation in work. Older workers are defined as 50+. We are including interventions delivered by employers, trade unions, third sector organisations and other providers as long as the intervention concerns work.

Intervention n/a.

Comparator n/a.

Study designs to be included Qualitative, quantitative, literature reviews, conceptual papers.

Eligibility criteria We included articles which are focused on: a) digitalisation; b) older people and c) interventions to support older people in the adoption of digitalisation in work. Interventions include those which are delivered by employers, third sector organisations as long as they concerned older people and work. We included peer reviewed articles and peer reviewed book chapters in our search but excluded entire books, conference papers, theses and grey literature. There were not geographical restrictions in our search. Where we identified a non-English publication, we have sought two native language speakers to review the publication. Only when we were unable to find two readers did we exclude non-English publications.

Information sources The databases Scopus, Pubmed and Web of Science were used.

Main outcome(s) To be determined.

Additional outcome(s) n/a.

Data management Data is being stored and analysed using Covidence.

Quality assessment / Risk of bias analysis We used Covidence to review and screen articles. The study selection process was conducted in three stages. First, a title and abstract screening was conducted. Teams of two reviewed each articles. They reviewed each study and, where there was a difference of views (or at least one considered the study a 'maybe'), one of two conflict arbiters made a final determination. After screening, studies which were determined to fit our inclusion criteria were extracted as full text and again reviewed by a team of two. If at that stage, articles were excluded, we recorded the reason on Covidence. Again, where there was a difference of views or ambiguity, one of two conflict arbiters made the final determination. Finally, two co-authors each recorded data extraction and the data arbiters reconciled the two sets of material recorded. In the end, we selected eighty-three articles to include.

Strategy of data synthesis The scoping review followed the PRISMA protocol and Arksey and O'Malley's (2005) steps for defining and executing a scoping review (reference). PRISMA is used in systematic reviews that focus on evaluating health, social or educational studies (Sohrabi et al., 2021). We included studies which were quantitative, qualitative as well as conceptual papers and scoping and systematic reviews. Data extracted included publication year, design, methodology and key findings. During key stages of title and abstract review, full text review and extraction, a team of two reviewers carried out the selection with one of two arbiters resolving conflicts. Weekly meetings are being carried out to discuss emerging findings and agree next steps.

Subgroup analysis n/a.

Sensitivity analysis n/a.

Language restriction English. Where we find non-English publications, we have sought 2 native speaking reviewers to analyse the publication. If two native speakers could not be found, we excluded the article.

Country(ies) involved UK; Ireland; Poland; Portugal; Lithuania; Romania; Turkey ; Kosovo; North Macedonia; Moracco; Finland; Norway.

Keywords aging, older workers, age inequalities, digitalization, digital technologies, digital skills, human resource management.

Dissemination plans Findings to be discussed at business an gerontological focused conferences and peer-reviewed journals.

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