An Integrative Literature Review: The Dual Impact of Technological Tools on Health and Technostress Among Older Workers

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Abstract

Introduction: The global population is ageing, life expectancy is gradually increasing, and employment is extended. We wanted to use an integrative literature review to study how using technological tools improves the quality of working life among older workers.

Methods: The integrative literature review method following PRISMA guidelines was used. The selection of articles in English was made according to the following inclusion criteria: scientific papers, content relevance and topicality. The literature search covered the bibliographic-catalogue databases Web of Science, PubMed, and Scopus. After selection, a qualitative content analysis was applied to the data.

Results: From the initial twelve articles, we gained insight into how using technological tools impacts the quality of working life among older workers through a substantive analysis of twelve scientific articles. Two content categories were identified: health of older workers and technostress. Regarding the impact on health, studies have focused on various health outcomes like sleeping quality, mental health, workability arthritis as a chronic condition, physical and quality of life in older community-dwelling low-income, diet, physical activity, stress and tobacco use, stress, and job quality. Studies regarding technostress that we identified show mixed effects of significant and non-significant effects.

Discussion: Digital technologies can potentially improve the quality of working life among older workers but are currently under-researched. Further research is needed to develop effective interventions and evaluate their impact on the quality of life of older workers.

1. INTRODUCTION

Population ageing refers to the increasing proportion of older individuals in a population (United Nations, 2019). There were 90.5 million older people aged 65 + living in the EU27 at the start of 2019; this equated to approximately one-fifth (20.3%) of the total population (Eurostat, 2020). An ageing population presents challenges for healthcare systems, pension systems, and labour markets, as well as for families and communities (United Nations, 2019). Extended working life refers to the need for people to work beyond the traditional retirement age of 65 years (Weiss et al., 2022). The increase in life expectancy has resulted in people living longer and healthier lives, which has led to the need for extended working life (Christensen et al., 2009).

In recent years, technology has revolutionized the quality of our lives. Technological tools, smartphones, computers, and the internet have become an integral part of our daily routine (i.e., at work). Technology is an umbrella term for applying knowledge, techniques and systems for practical purposes and can be analogue or digital (LaMeres, 2017). Analog technologies refer to the use of specific tools on the continuous frequency that improves the quality of life (i.e., old-style radio, types of sensors), while digital technologies refer to data manipulation, storage, transmission and processing of data in digital format to allow the dynamic quality of life (i.e., web-based platforms, smartphones, computers, digital cameras, digital videos/audios, etc.). Each type of technology has its advantages and disadvantages. The impact of technology is not only limited to younger generations but also significantly influences the quality of life of older workers (Giuseppina et al., 2020). The impact of technology on the quality of life of older workers is an important issue, as they are a significant segment of the workforce and are often overlooked when it comes to technological advancements (Damant et al. 2017). The use of technology has brought about significant changes in the workplace, including increased efficiency,

faster communication, and more flexibility (Davis et al., 2019). For example, technology can improve older workers' quality of life by providing them greater flexibility and opportunities to work from home (Pit et al., 2021). Furthermore, there is an ongoing debate about the effects of the human-technology interaction (i.e., positive, or negative) and results from studies indicate that this phenomenon needs to be analyzed with mixed methodologies for a clear image of its effects due to its complex conceptualization (i.e., technostress and technological change in organizations; Pouludi et al., 1999; Sellberg and Susi, 2014). Early studies have emphasized the impact of digitalization for workers and showed that mental strain was significantly smaller than for those actively using digital tools (Rodriguez and Pattini, 2011), but others recorder that digital tools were easily and efficiently implemented by workers even if they were so-called „low-level" workers (DiBello and Missildine, 2010). This debate is ongoing, recent results argue that information technology and individual-level culture dimensions can trigger technostress for employees (Ma and Turel, 2019). All in all, technology can facilitate communication and collaboration, which can enhance job satisfaction and reduce social isolation (Chen and Schulz, 2016).

Quality of life is a multidimensional concept encompassing physical, psychological, social, and environmental aspects (Post, 2014). Quality of life is an important indicator of well-being and has been linked to various positive outcomes such as job satisfaction, health, and life satisfaction (Park, 2004). For older workers, quality of life is particularly important as they face unique challenges in the workplace (Peterson & Spiker, 2005). These challenges include ageism, increased physical limitations, and balancing work and caregiving responsibilities (Boudiny, 2013).

The purpose of a systematic literature review is to describe how the use of technology in older workers can affect their quality of life. The aim is to identify how using technological tools improves the quality of working life among older workers.

2. METHODS

The research used a descriptive method, an integrative literature review, allowing us to gain new knowledge about the research problem through reviewing, critiquing, and synthesizing the studied literature (Torraco, 2016) under PRISMA guidelines (Page et al., 2021).

The literature search included bibliographic-catalogue databases Web of Science (Web of Science Core Collection, BIOSIS Citation Index, Current Contents Connect, Data Citation Index, Derwent Innovations Index, KCI- Korean Journal Database, Medline, Russian Science Citation Index), PubMed, and Scopus. When searching the literature, we considered inclusion and exclusion criteria (Table 1).

Table 1
Inclusion and Exclusion criteria

Criterion	Inclusion criteria	Exclusion criteria
Field	The impact of technological tools on the quality of working life for older employees	Other
Population	Older workers over 50 years old	Younger than 50 years old
Language	English	Any other language
Type of papers	Peer-reviewed	No peer-review
Type of publication	Quantitative, qualitative, and mixed methods	Theoretic, reviews, synthesis

To search for literature in English, we used the following keywords in different combinations: older worker*, older employees, quality of working life, and technology. Keywords were combined with Boolean operators (AND, OR) into different combinations (Table 1.). The literature search ran until 6 April 2023. We selected evidence that was published in credible and international journals that were peer-reviewed. This was one of the inclusion criteria.

Table 2
Search strategy with Boolean logical operators

Database	PubMed	WoS	Scopus
Search strategy	(Older worker*) OR (older employees) AND (quality of working life) AND (technology)	((((TS= (OLDER WORKER*)) OR TS= (OLDER EMPLOYEES)) AND TS= (quality of working life)) AND TS=(technology))	Older workers" OR " older employees" AND " quality of working life" AND "technology."
Registers	87	99	92

3. LITERATURE REVIEW

Among twelve research studies, eleven studies utilized a quantitative research design. Further, about four studies utilized a cross-sectional design, about eight adopted a survey questionnaire, one adopted an index, one with experimental design and one with a control trialled. Moreover, in the twelve articles, about six studies are sociological research, five are health studies, and one is psychological. Additionally, most of the studies focus on older workers over 50.

The study by Konstantoulas et al. (2020) focused on the Pittsburgh sleep quality index, heart rate, physical activity and medical records. This study sampled five older officers, and the results showed a positive correlation between monthly calculated scores and self-reported sleep quality, which suggested that the proposed approach is reliable for assessing sleep quality in the smart work system. Further, le Roux and Botha (2021) utilized a quantitative research design and conducted a cross-sectional study targeting 192 individuals from ferrochrome smelting plants in South Africa. This research uncovered that technostress significantly negatively impacts life satisfaction and has no impact on productivity.

Further, Gonzales and Morer (2015) provided a comprehensive review of ergonomic factors facilitating the inclusion of older workers towards a knowledge workforce. This study utilized IDEO method card tools, and the

participants were classified into three age groups, including 24–35, 36–59 and 60–70. This research found that most ergonomic designs are utilized incorrectly because of a lack of consistency regarding tool adjustment. On the other hand, Bláfoss et al. (2019) utilized quantitative design by conducting a cross-sectional study with the completed questionnaires of 7706. The study resulted those workers having greater sleep problems reported less high-intensity leisure-time physical activity.

Likewise, Koreshi and Alpass (2022) focused on the older working class of New Zealand to identify the predictors of workability and quality of life. This study utilized a quantitative study which focused on the cross-sectional period and sampled about 1154 respondents, of which about 696 were with arthritis and about 458 were without arthritis. This study resulted that older respondents diagnosed with arthritis have shown lower levels of workability as well as low quality of life as compared to respondents without arthritis. Similarly, Prazeres and Passos (2021) adopted a quantitative design with the target population of health professionals. The findings of this research showed that non-physicians possessing a low level of expertise in their profession and having a lower quality of life have a greater probability of experiencing age discrimination.

Additionally, Andersen and Emil Sundstrup (2019) utilized quantitative in which the target population was 17885 Danish older workers. The research explored the influence of new technology in the workplace by taking the case of the last two years with seven aspects of positive and negative related to technology. Alternatively, Yin et al. (2021) conducted a psychological study by adopting a quantitative design, focusing on the three-month experiment strategy with a target population of 49 older Latino adults. This research found modest results for psychological and health outcomes of older clients through their participation in a Chinese program related to healthy ageing. This research showed greater satisfaction of participants with the programs offered through advanced technology.

Cook et al. (2015) conducted a health study using a quantitative design with a controlled trial. This study targeted 278 older US office workers aged between 50 to 68. This research reported that the HealthyPast50 works particularly for behavioural change self-efficacy, healthy eating, and mild exercise. Further, Borle et al. (2021) adopted a quantitative design with a cross-sectional focus, targeting 3180 older individuals above 60. This research reported all participants utilizing ICT in the work setting and found that ICT usage does not harm mental health or workability.

Further, Kortmann et al. (2021) adopted a quantitative research design by focusing on the German Ageing Survey of 2014. This research implemented the MICE technique and targeted 50 participants in the second half of their working lives, aged 45 to 65. This research resulted in a positive impact of digitalization but also found that workers in a highly digitalized working report greater stress levels due to negative environmental factors. Similarly, Nimrod (2018) also conducted quantitative research through a survey by targeting 537 older Israeli internet users. This research resulted that techno-stress is a critical problem in older individuals and found five potential stressors contributing to greater levels of technostress within older individuals. This research focused on recognizing technostress among older individuals, and more research should be done on its influence on well-being.

Table 3

Design, sampling, assessment, and results of the included studies

Author(s)	Methodology and sample size	Purpose	Main Findings	Author(s)
1.	Konstantoulas et al. (2020)	Quantitative Pittsburgh Sleep Quality Index, Heart Rate, physical activity, and medical records. *N* = 5 users are registered. Age: over 50 Type of workers: older officers	Test and assess the use of a technological tool (SmartWork System) for older office workers to improve their sleep quality. It helps older workers continuously assess their sleep quality, which supports the triggering mechanism for behavioural and lifestyle interventions to adopt healthier sleep habits and increase their sleep quality and satisfaction.	Although there are important limitations of this research (i.e., the number of participants), the overall experience of participants indicates that there was a strong correlation between the monthly automatically calculated scores and self-reported sleep quality, indicating that the proposed approach is a reliable quantitative method for assessing sleep quality in the SmartWork system.
2.	le Roux and Botha (2021)	Quantitative Questionnaires Cross-sectional design N total = 192 N older workers between 51–60 years old = 17 N older workers between 61–70 years old = 3 Type of workers: managers within five ferrochrome smelting plants in South Africa	A descriptive and comparative study regarding technostress on productivity and overall life satisfaction for managers in South Africa. Gender comparison and age group differences were tested.	General findings indicate significant age group differences between younger and older workers for techno-complexity, techno-invasion, and techno-uncertainty in that older participants experience elevated levels compared to the younger group. There are no significant results regarding techno-overload, techno-insecurity and technostress as a global score regarding age groups.

Author(s)	Methodology and sample size	Purpose	Main Findings	Author(s)
3.	Gonzales and Morer (2015)	**Qualitative** **Field study** **The first study** used IDEO method card tools (i.e., Extreme User Interviews, Card Sort, Surveys and Questionnaires, Behavioral Archaeology and Fly on the Wall). **Participants**: Participants were classified into age groups: 24–35, 36–59 and 60–70. *N = unavailable* **Second study**: **Methodology**. Designers were asked about what information they would look for and what information they would be missing from the content (draft version of content to be included in InWoDG) they were asked to look at, what methods they apply before and after the conceptual phase, and how the content should be arranged to fit with design practice. **Participants**: Only product designers were selected for this field study. They have different levels of expertise, from junior to master. *N = unavailable*	The study's main purpose is to propose and test a theoretical framework for developing a guidance tool for assisting designers in improving the ergonomics and quality of the work environment (i.e., tools, workstations, and workspace) for older workers. Two field studies were carried out: a) **First study**: Assessing the needs and preferences of the users who work at the workstation to obtain information on how inclusivity and ergonomics are applied in practice and how this varies with age and new trends in the workforce and the workplace. b) **Second study**: Assessing the needs and preferences of the designers of these workstations. This study addressed designers' specific needs, content, and format. This field study was based on a survey to get qualitative information. Whether the designer's needs and preferences described in the literature would match the participants' needs.	**First study results**: One of the findings from this field study revealed that even the most ergonomic designs were being used incorrectly due to a lack of consistency in tool adjustments. As a result, older knowledge workers could not fully benefit from an ergonomic workstation, and users of all ages and workspaces faced similar challenges. **Second study results**: The results showed that all participants considered the context and user of the designed product, emphasizing the importance of field research and rich information. Tight deadlines for time resources and research were acknowledged, but participants valued anything that could facilitate the information process, provide guidance, and suggest related information. Some participants appreciated case studies of specific products. Experienced designers were found to be more selective in their use of tools and information compared to novices, and a filter that personalized information based on the brief and preferences was seen as a valuable tool.

Author(s)	Methodology and sample size	Purpose	Main Findings	Author(s)
4.	Andersen and Emil Sundstrup (2019)	Quantitative N to entire questionnaire = 15,721 N total at least in part of the questionnaire = 17,885 Type of population: Danish older workers.	The main goal of this study is to explore the push-and-stay mechanism for labor market participation among older workers over 50 years. The survey also explored the impact of new technologies in the workplace. The study is part of the SeniorWorkingLife project.	The survey is the first stage of an ongoing project, and it proposes to explore the impact of new technologies at the workplace, specifically the introduction of new technologies in work during the last two years, and seven aspects regarding the positive and negative aspects of technologies. Only expected results are discussed, and the project's relevance is discussed; no specific results are described about the impact of technology on older workers.
5.	Koreshi and Alpass (2022)	Quantitative study (cross-sectional survey) N = 1154 Type of population: older workers (N = 696) and retirees.	To investigate the associations between workability and quality of life and sociodemographic, health-related, and work-related factors	Living with a chronic health condition such as arthritis can further affect older workers' perceptions of their ability to continue in the workforce and their quality of life.
6.	Prazeres and Passos (2021)	Quantitative study (questionnaire survey) Type of population: N = 369 health-related professionals	To characterize age discrimination at work in health-related professionals and to explore its association with demographic variables	Non-physicians with less professional experience and lower quality of life may experience age discrimination more frequently.
7.	Bláfoss et al. (2019)	Quantitative study (cross-sectional study) N = 7706	To investigate the association between sleep problems and the duration of low- and high-intensity leisure-time physical activity in sedentary and physical workers.	Workers, particularly sedentary older workers, having sleep problems report less high-intensity leisure-time physical activity.

Author(s)	Methodology and sample size	Purpose	Main Findings	Author(s)
8.	Yin et al. (2021)	Quantitative Theoretic review and experimental design over three months. N for the therapeutic intervention = 49 Type of population: Professionals involved in developing the de protocol and the program and 49 older Latino adults tested the program.	Test the viability of FITxOlder, a Community Health Worker (CHW)-led, mobile technology-assisted Chinese Qigong mind-body exercise program designed to promote healthy ageing among sedentary Latino adults residing in low-income communities.	The main findings report modest but significant results regarding older people's psychological and health outcomes after participating in the technology-assisted Chinese Qigong mind-body exercise program designed to promote healthy ageing. All additional findings report that participants are satisfied with the program, and they have a good interaction with the program offered through technological tools (i.e., smart tablet)
9.	Cook et al. (2015)	Quantitative Controlled-trial N = 278 Ages between 50 to 68 Type of population: US office workers of a large global information technology company.	Testing a Web-based health program for older workers (HealthyPast50) to improve health outcomes like diet, physical activity, stress and tobacco use. They used both a control group and before-and-after three months after the program.	The program is effective, especially for behavioural change, self-efficacy, planning healthy eating and mild exercise. Some other significant results were also found for eating practices, exercise self-efficacy, exercise planning and ageing beliefs. Gender effects suggest that the program's effects on exercise are due mainly to improvements among women.
10.	Borle et al. (2021)	Quantitative Cross-sectional N = 3180 Age over 60 Type of population: older workers registered in Germany as the third wave of the German lidA (an acronym for 'living at work') cohort study on work, age, and health	The study explored the negative impact of ICT use on older workers regarding their physical, mental health and workability. ICT exposure refers to the ICT use of digital work intensification.	Almost all the participants reported using ICT at work, and almost 20% reported high levels of digital work intensification. Although ICT use is not significantly and negatively associated with mental health or workability, digital work intensification is negatively associated with mental health and workability overall and across socio-economic positions.

Author(s)	Methodology and sample size	Purpose	Main Findings	Author(s)
11.	Kortmann et al. (2021)	Quantitative German Ageing Survey of 2014 Multiple imputations with chained equations (MICE) M = 50 Age of 45 and 65 Type of population: The study focuses on employees in the second half of their working lives in Germany, who are subject to social insurance contributions and employed full- or part-time.	The study aims to answer whether working in more digitalized occupations is associated with lower subjective job quality. The study differs from previous research on the impact of digitalization on subjective job quality by considering a comprehensive view of the concept and including positive and negative aspects.	The study found that digitalization has predominantly positive effects, but employees in more digitalized occupations report higher stress levels due to negative environmental factors. The study suggests that job quality is a multidimensional concept and that subjective measures of job quality are essential in determining an employee's well-being. The study adds to the existing literature on the relationship between digitalization and job quality by including workers in the second half of their lives, who are more vulnerable to becoming outdated due to technological advancements.
12.	Nimrod (2018)	Quantitative Self-enumerated scale and survey N = 537 Aged over 60 years. Type of population: older adults, Internet users aged 60 years and over, from Israeli	The article aims to draw attention to the previously neglected negative impact of Information and Communication Technology (ICT) use on older adults' well-being and to present a scale to measure technostress among this population.	The study found that technostress is a significant issue among older adults, with respondents' total technostress scores ranging from 5.33 to 22.00, reflecting a broad range of stress levels among older Internet users. The study identified five potential stressors, including techno-complexity, techno-invasion, techno-overload, techno-uncertainty, and techno-insecurity, contributing to technostress among older adults. The study emphasizes the need to recognize technostress among older adults and to research its impact on well-being further.

Table 4
Synthesis of findings based on an integrative literature review.

Category	Content subcategory	Author(s)
Health	Web-based health programs for older workers improve health conditions.	Cook et al. 2015
	Sedentary older workers having sleep problems report less high-intensity leisure-time physical activity.	Bláfoss et al. 2019
	Living with a chronic health condition can further affect older workers' perceptions of their ability to continue in the workforce and their quality of life.	Koreshi and Alpass 2022
	A strong correlation between the monthly automatically calculated scores and self-reported sleep quality	Konstantoulas et al. 2020
	Digital work intensification displayed negative associations with mental health and workability.	Borle et al., 2021
	Technology-assisted mind-body exercise program impact on psychological and health outcomes of older people.	Yin et al. 2021
	Digital work intensification is negatively associated with mental health and workability.	Borle et al. 2021
Technostress	Age discrimination is often experienced by non-physicians with less experience and a lower quality of life.	Prazeres and Passos 2021
	Older respondents are experiencing slight levels of techno-invasion, adding to perceived levels of technostress.	Le Roux and Botha (2021)
	Technostress is a significant issue among older adults	Nimrod (2018)
	Employees in more digitalized occupations report higher stress levels due to negative environmental factors.	Kortmann et al. (2021)

4. DISCUSSION

The general goal of the study was to review the impact of technology on the quality of working life for older workers. Previous systematic reviews and studies regarding the impact of technological tools debate both the negative and positive effects on the quality of working life for older workers (Dantas et al., 2019; Lavoie, 2010; Stara et al., 2020; White & Smeaton, 2016) due to work demands that could conflict with expectations of older workers. Nevertheless, most professionals agree that it is important to address this issue and to argue for increasing technological abilities for older people, especially if they want to be active and promote quality of life (Miller & Jones, 2019). One study conducted by Davis and colleagues (2018) found that the use of digital technology positively affected the well-being of older workers. The study found that digital technology increased job satisfaction and reduced work-related stress. Additionally, the study found that digital technology was associated with increased social support and reduced social isolation. Another study by Fang and colleagues (2018) found that using digital technology negatively affected the mental health of older workers. The study found that the use of digital technology was associated with increased levels of stress, anxiety, and depression. Additionally, the study found that using digital technology was associated with increased feelings of social isolation. Our results align with this debate and show that different results depend on the type of outcome,

technological tools and context and age group. Generally, we have identified two thematic categories that are most impacted for older workers: an impact on health and technological stress.

Regarding the impact on health, studies have focused on various health outcomes like sleeping quality (i.e., Blafos et al., 2019; Konstantoulas et al., 2020), mental health and workability (i.e., Borle et al. 2021), arthritis as chronic condition (i.e., Koreshi and Alpass, 2022), physical and quality of life in older community-dwelling low-income adults (i.e., Yin et al., 2021), diet, physical activity, stress and tobacco use (i.e., Cook et al., 2015), stress and job quality (Kortmann et al., 2021). Overall, studies indicate that technological tools assessing health outcomes are reliable and can provide insight to trigger mechanisms for behavioural and lifestyle interventions to adopt healthier sleep habits (i.e., Konstantoulas et al., 2020). Borle and colleagues (2021) found mixed effects, ICT use does not negatively impact mental health or workability, but digital work intensification is negatively associated with mental health and workability for older workers. Studies that tested web-based programs for improving health outcomes reported modest but significant improvements for mind and body (i.e., FitxOlder mobile technology-assisted Chinese Qigong mind-body exercise program, Yin et al., 2021) and that they are effective for behavioural change, self-efficacy, planning healthy eating and mild exercise (i.e., HealthyPast50 web-based health program for older workers (Cook et al., 2015). Kortmann and colleagues (2021) generally report positive effects of digitalization but also that more digitalized occupations face elevated stress levels in specific negative environmental factors.

Studies regarding technostress that we identified show mixed effects of significant and non-significant effects. Results generally indicate higher levels of technological stress in some important aspects specific to working life. For example, le Roux and Botha (2021) found that older workers experience higher levels of techno-complexity, techno-invasion, and techno-uncertainty but not for techno-overload, techno-insecurity or the overall score for technostress when compared with younger groups. Nimrod (2018) also found that technostress is significant for older workers over 60, and all its components are significant aspects for them and with possible negative impacts on their well-being. Gonzales and Morer (2015) identified in their studies that lack of consistency in tool adjustments affects the ergonomics of a workstation for older workers and in general. Finally, Andersen and Sundstrup (2019) anticipate both the negative and positive effects of technology and propose to assess both aspects for their long-term project (i.e., the Senior Working Life project). Although the other studies were focused on health outcomes, researchers have often assessed also the technological impact and satisfaction that the use of technological tools has for older workers. For example, Borle and colleagues (2021) report that 92% of participants reported ICT use at work. Almost 20% reported high levels of digital work intensification, while a similar proportion did not experience digital work intensification.

Similarly, Yin and colleagues report the impact of technological tools, with participants reporting that they are familiar with a technological tool (i.e., a tablet) and that although the protocol of the intervention was disrupted, the recruitment, retention and fidelity of participants was high. Finally, three studies lack the involvement of technological tools (i.e., Bláfoss et al., 2019; Koreshi & Alpass, 2022; Prazeres & Passos, 2021). Although they lack to test the impact of technological tools, they bring important insights into the quality of the working life of older adults, especially for health outcomes and age discrimination patterns.

5. LIMITS OF THE STUDIES

Research on the general topic is diverse, but efforts so far are consistent. Nevertheless, we also identified some limits of studies that raise several questions about the real impact of technological tools on the quality of the working life of older workers. First, we limited the literature review to the results in English, which we assess as a

limitation of the research. Despite English being the dominant language in research, it is also important to look for relevant articles in other languages, as relying solely on English can result in biased information, especially because research is so limited in this area. Most of the studies report a small number of older workers included in their groups, or they are mixed with non-working older participants or younger groups (i.e., Cook et al., 2015; Konstantoulas et al., 2020, le Roux & Botha and Yin et al., 2020).

Most importantly, most research design report age groups differently and does not use a specific age cut-off (i.e., 55) since there are few older workers and categorize them depending on available data. Other research indicates their results without reporting all the details of their methods, like, for example, all the instruments used a specific number of participants (i.e., Gonzales & Mores). Furthermore, some of the studies give limited insight into the impact of technology on at-risk groups (i.e., chronic health conditions such as arthritis, Koreshi and Alpass 2022) or facing daily problems (i.e., sleep problems, Blafos et al., 2019). Finally, one study limited their research on expected results and methods for long-term projects (i.e., Andersen & Sundstrup, 2019).

6. CONCLUSION

Digital technologies can potentially improve the quality of working life among older workers but are currently under-researched. Interventions such as wearable devices, web-based health promotion programs, ergonomic design, and continuous sleep quality monitoring can positively impact physical and mental health, work ability, productivity, and overall well-being. However, the complex and multidimensional nature of quality of life should be considered when assessing the impact of technology on older workers. Further research is needed to develop effective interventions and evaluate their impact on the quality of life of older workers.

Declarations

Acknowledgment

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Conflict of interest

Authors declare no conflict of interest related to the work.

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Figures

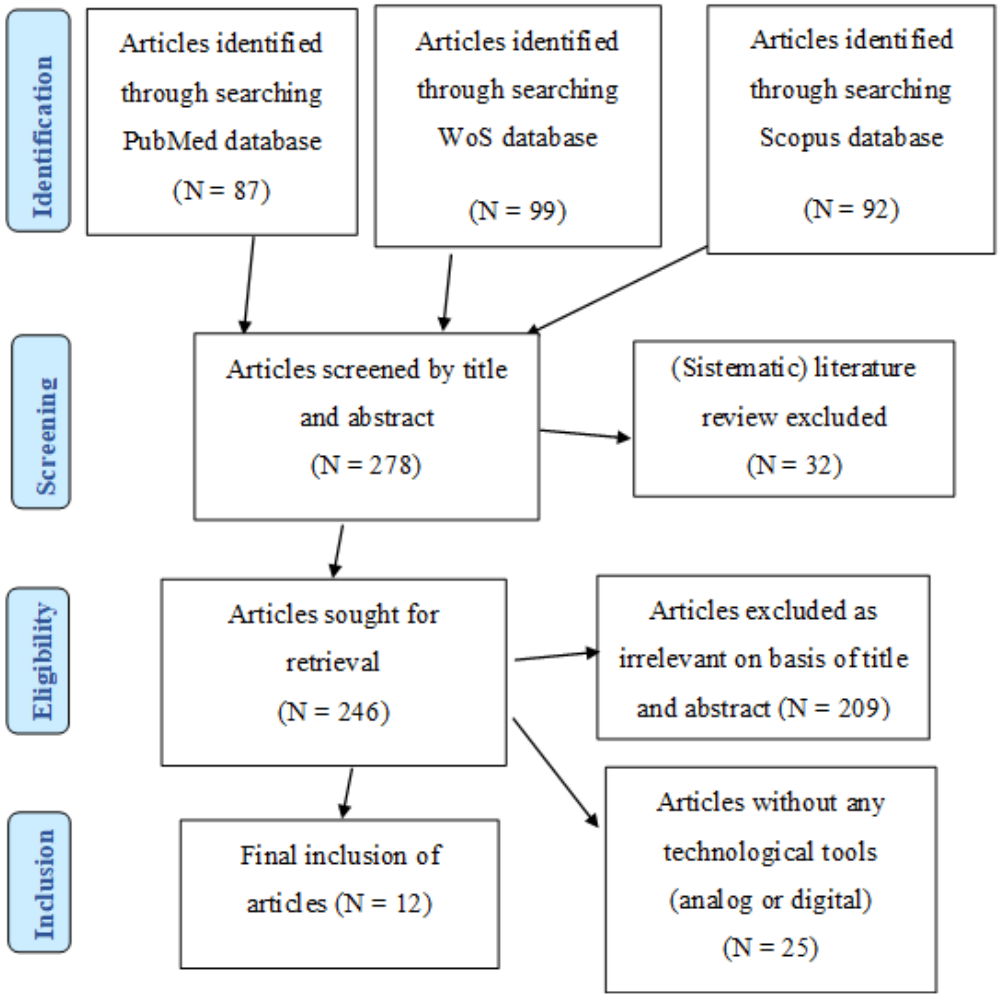

Figure 1

Flow diagram of the review process (Page et al., 2021)