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## Digital literacy during the coronavirus pandemic in older adults: Literature Review and Research Agenda

Assist. Mihael Nedeljko \*, Prof. Ddr. David Bogataj \*, Assist. Prof. Dr. Barbara Toplak Perović\*  
Assist. Prof. Dr. Boris Miha Kaučič\*

\*Alma Mater Europaea - ECM, Research Institute of Social Gerontology,  
Slovenska ulica 17, 2000 Maribor, Slovenia (e-mail: [mihael.nedeljko@almamater.si](mailto:mihael.nedeljko@almamater.si))

**Abstract:** Demographic change in the developed world is leading to a higher proportion of older adults and longer life expectancy. Measures to control the coronavirus disease have affected older adults the most. Social isolation and access to remote health services has been a problem for many people. We have used the method of scientific literature review. The selection of articles was made in accordance with the following inclusion criteria: accessibility, scientificity, content relevance and topicality. After selection, the results were analysed by qualitative content analysis. With the content analysis of twenty scientific articles, we gained an insight into digital literacy of older adults during the COVID-19 pandemic. Three content categories were identified: (1) poor digital literacy of older adults, (2) inequality in ICT access, (3) use of ICT reduces the negative impact of social isolation. We note that there is a large digital divide in digital literacy and competences among older adults which expanded during the coronavirus disease pandemic. Several factors, including socio-economic status, internet access and the poor adaptation of ICT for older adults affect digital literacy. Rapid development of remote health and social care, poor digital literacy of older adults and the poor adaptation of ICT for older adults dictate that the problem must be tackled systemically.

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**Keywords:** older adults, ICT, digital literacy, COVID-19, digital divide

### 1. INTRODUCTION

ICT plays an important role in people's daily lives. The coronavirus disease pandemic has further reinforced the importance of ICT for all generations of people, bringing challenges, especially for older adults. Therefore, we examined the importance of digital literacy in older adults during the coronavirus disease pandemic.

The proportion of older adults is increasing in the developed world, leading to changes in the age structure of the population (Antczak & Lewandowska-Gwarda, 2019), increasing the number of people with age-related diseases and consequently increasing demand for home care services (Karlsen et al., 2017).

Measures to limit the coronavirus pandemic have changed many aspects of daily life around the world (Elisabeth et al., 2021), including limited access to health services, measures to control the spread of infection in nursing homes, treatment of elderly adults after hospital admission, in palliative care and with the introduction of telecare (Yeung et al., 2020). The main obstacles in the implementation of telemedicine are the lack of technology and digital (non) literacy of older adults (Scott Kruse et al., 2018). Digitisation has become more pronounced in recent years as countries seek to adapt to a changing world and improve the living standards of their citizens (Kravchenko et al. 2019), with vulnerable older adults unable to keep up with such rapid digital progress (Sun Lim & Ling Tan, 2003), although smart technology may delay or prevent moving to a home for the elderly (Rogelj & Bogataj, 2018a; Rogelj &

Bogataj, 2018b; Rogelj et al, 2019). The digital divide represents a social division between those who have the resources and access to information and communication technology (ICT) and those who face barriers to accessing and using ICT (Ramsetty & Adams, 2020). The term ICT is used for a set of computer, information and communication devices, applications, networks and services (Baudchon & Brossard, 2003).

The availability of information and communication technology often depends on digital literacy (Marston et al. 2019). Rapid development and the increasing role of ICT require more developed digital skills from us (Dolničar & Mrzel, 2015). Digital literacy requires more than just the ability to use software or handle a digital device; it includes many different complex skills, such as cognitive, motor, sociological, and emotional skills that users need to make effective use of the digital environment (Alkali & Amichai-Hamburger, 2004). Learning new digital technologies can help older adults to integrate into today's digital society, but this is not always easy for them (Tsai et al., 2017). Successful participation in video visits requires access to high-speed Internet and ICT (computer, smartphone, tablet, etc.), and a certain level of digital literacy (Gilson et al., 2020). The digital divide was initially attributed to underdevelopment and was perceived as something temporary which will disappear with the popularisation of technology, but it still exists despite mass sales of digital devices with Internet access (Lai & Widmar, 2021).

By reviewing the literature, we want to determine the importance of digital literacy in older adults during the coronavirus pandemic. Based on the definition of the research problem, we formulated a research question: What impacts does digital literacy have on the daily lives of older adults during the coronavirus disease pandemic?

2. METHOD

In our research, we used a descriptive method - a scientific literature review from the field of digital literacy of older adults during the COVID-19 pandemic. The literature search included the bibliographic-catalogue database 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). In order to search for literature in the English language, we used the following keywords in various combinations: older adult\*, elder\*, senior, digital literacy and covid.

The keywords were combined with Boolean operators (AND, OR) into different combinations, as shown in Table 1. The literature search was conducted until May 5, 2022.

Table 1. Literature search strategy

	Web of Science
Search string	(((((TS=(older adult*)) OR TS=(elder*)) OR TS=(senior*)) AND TS=(digital literacy)) AND TS=(covid*))
Hits	65

In Table 2 the inclusion and exclusion criteria are presented. In the literature search we considered the criterion of language. We have limited ourselves to the results in the English language, which are available in full text. In our analysis we used only original scientific articles.

Table 2. Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Field of work	Digital literacy by older adults during COVID-19 pandemic	Other
Population	Population older than 65 years of both sexes	Population younger than 65 years of both sexes
Language	English	Language other than English

Access	Full text	Summaries, descriptions, short reports
Type of publication	Published articles by COBISS typology (original scientific article, review scientific article)	Published articles - popular, unpublished material, systematic review

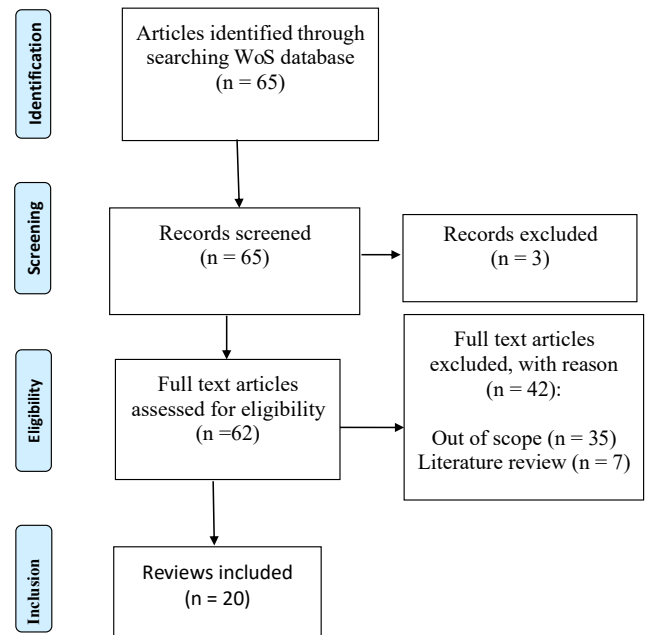


Fig. 1. Flow diagram of review process (Page et al., 2021).

3. FINDINGS OF THE LITERATURE REVIEW

The review of the literature included 20 scientific articles according to the inclusion criteria which are presented in Table 2. After reviewing the literature, we synthesised the main findings into three groups: (1) poor digital literacy of older adults, (2) unequal access to ICT for at-risk populations, and (3) the use of ICT reduces the negative impact of social isolation.

Table 3. Major findings of the literature review

During isolation due to the coronavirus pandemic, older adults do not see the opportunities offered by ICT to establish and maintain social contacts, nor do they have sufficient knowledge to use ICT (Hošnjak & Pavlović, 2021).
Due to the long-lasting coronavirus pandemic, telemedicine in the form of telephone conversations has developed in geriatric psychiatry in India. It is limited by poor digital literacy, sensory problems, and cognitive impairment in older adults (Sivakumar et al., 2020).
Telehealth is likely to remain a key element in the treatment of geriatric mental illness even after the coronavirus pandemic. Increasing attention is being paid to digital

literacy, which affects the ability of older adults to use telecare technology (Adrien et al., 2022).
The use of telemedicine during the coronavirus pandemic has increased. Vulnerable groups are also particularly exposed to barriers restricting their accessing of ICT, these being older adults, low-income people and members of minorities (Alkureishi et al., 2021).
Telemedicine will continue to play an important role in access to clinical care even after the end of the coronavirus pandemic, meaning that it is essential that the health system focuses on promoting equal access to increasingly technology-based health care for all patients, including older adults (Chu et al., 2022).
The coronavirus pandemic demonstrated the enormous digital exclusion of older adults, while encouraging them to adopt new technologies to alleviate social isolation and loneliness (Martínez-Alcalá et al. 2021).
Older adults have faced great inequalities in access to technologies and the ability to use them in the past, therefore many older adults did not see the benefits in ICT as the younger generation did. Older adults have faced the worst consequences of the epidemic, with an increased risk of physical and mental illness, and the digital divide has not mitigated these consequences (Martins Van Jaarsveld, 2020).
By learning to use Zoom and WhatsApp, older adults increase digital literacy, reduce the negative effects of social isolation on mental health, and the well-being of older adults is improved (Shapira et al., 2021).
Older adults have been choosing and using online health resources due to the coronavirus disease pandemic, and their ability to use online networks has improved. This indicates the ability to adapt and raise intrinsic motivation (Li et al., 2022).
The digital divide, influenced by personal attitude, motivation, education, and income, during the coronavirus disease pandemic, excluded older adults from both real and virtual society (Song et al., 2021).
Older adults, who are not digitally literate, can use ICT if they apply appropriate traditional methods that they already know (Kim et al., 2022).
Government, agencies, and families should take an active role in making older adults feel able to manage their health and daily lives with useful information from the Internet and reduce their anxiety (Leung et al., 2022).
Access to telehealth has improved, yet there is great inequality among vulnerable groups. Education and training should be considered to improve access to telehealth for vulnerable populations following a coronavirus pandemic (Ng et al., 2022).
Some older adults find it difficult to use the touch screen and so are forced to use older push-button devices. Volunteers have helped older adults to overcome physical barriers to mobile use, and there are many systemic gaps in the mobile adult industry for older adults, especially for the illiterate and physically handicapped (Lim et al., 2022).
ICT may provide social interaction during the coronavirus pandemic, but older adults often do not have access to these technologies and skills, and the experience to use them (Moore & Hancock, 2020).

Socio-economic factors influence access to telehealth (Nadkarni et al., 2020).
Factors associated with the availability and utilisation of telehealth in older adults during the coronavirus pandemic include Internet access, sociodemographic status, and digital literacy (Ng & Park, 2021).
Factors such as old age, older adults living alone, and low social support increase the likelihood of older adults not using social media to communicate with friends and family (Savage et al., 2022).
Connecting online and offline strategies is invaluable in addressing the challenges faced by older adults, as digitisation alone is not sufficient to reach the vulnerable population (Xie et al., 2020).
Lower income and lower levels of education can be a barrier to older adults accessing and using ICT (Yu & Hagens, 2022).

#### 4. DISCUSSION

In the following, we provide an answer to the posed research question.

##### *Identified gaps*

1. In reviewing the literature, we find that there is a large inequality in access to ICT among older adults. Access to ICT is influenced by lower income and lower levels of education (Yu & Hagens, 2022), old age and older adults living alone (Savage et al., 2022), access to the Internet (Ng & Park, 2021) and socio-economic factors (Nadkarni et al., 2020).

2. The current coronavirus crisis has further highlighted the problem of digital exclusion of older adults (Martínez-Alcalá et al. 2021). The inadequacy of ICT for use by older adults needs to be highlighted. Older adults have trouble using the touch screen and so are forced to use older push-button devices. This points to many systemic gaps in the mobile adult industry for older adults, especially the ones who are digitally illiterate and who have physical disabilities (Lim et al., 2022). Use of video conferencing or smartphone applications can provide further support to patients and caregivers (Cuffaro et al., 2020). More steps should be taken to bridge the digital divide and build an older adult-friendly e-society (Song et al., 2021), therefore older adult education and training (Ng et al., 2021) should be considered, as digital literacy is essential for all who are excluded from the digital age and unable to use ICT effectively (Martínez-Alcalá et al., 2021). Martins Van Jaarsveld (2020) points out that more attention and resources must be devoted to older adults in order to improve their digital literacy and finally close the digital divide.

3. We observe that there is great inequality between different groups of people, including among older adults in access to telehealth (Ng et al., 2022). Telehealth offers a futuristic promise to provide basic health services for seniors around the world. However, the scope of these services through telehealth currently appears to be limited in countries with low and low to middle income (Doraiswamy et al., 2021). Telehealth has a positive impact on the care of people living in the community as it includes elements of education, counselling, psychosocial therapy, social support and clinical care itself (Zgonec, 2021), so it is necessary to improve digital literacy, which has a direct

impact on health literacy and quality life (Nedeljko et al., 2021) and allows older adults to use telecare technology (Adrien et al., 2022). Developers of digital solutions for older adults should consider how the solutions affect the quality of life of users who mostly have declining functional capabilities (Rogelj & Bogataj, 2020).

#### Research agenda

Due to measures taken to limit coronavirus, such as e.g. social distancing, older adults are exposed to an increased risk of adverse social and health consequences (Shapira et al., 2021), and they experience social isolation and loneliness (Martínez-Alcalá et al. 2021). Kaučič and colleagues (2016) highlight the influence of the social factor, which enables a person to live a full and quality life even in old age. ICT reduces social isolation and strengthens bonds between family members (Nedeljko et al., 2021), but additional measures are urgently needed to address the psychological suffering and unmet health needs of those who are constantly isolated or have barriers to technology-based social interaction (Kotwal et al., 2021). Mobility, information, inclusion in society and health must be accessible to individuals of all ages (Voljč & Emonicum, 2015). Health literacy, which is crucial for understanding and using health information, remains an underestimated problem during coronavirus (Paakkari & Okan, 2020) and is an indicator of quality of life (Nedeljko et al., 2021).

Some older adults adopted new technologies during the coronavirus pandemic (Martínez-Alcalá et al. 2021), most of them acquired ICT skills alone or with the help of family members (Hošnjak & Pavlović, 2021). Lie et al. (2022) found that, during this time, the ability to use online networks improved in older adults, which increased their digital literacy, reduced the negative effects of social isolation on mental health, and improved the quality of life of older adults (Shapira et al., 2021). On the other hand, there is a large proportion of older adults who do not have access to these technologies and skills or the experience to use them (Moore & Hancock, 2020) or access to the Internet (Ng & Park, 2021). This is influenced by lower income and lower levels of education (Yu & Hagens, 2022), high age, older adults living alone, and low social support (Savage et al., 2022). Therefore, as stated by Chu et al. (2022) promoting equal access to increasingly technology-based healthcare for all patients, including older adults, is essential as social cohesion is an important factor influencing life satisfaction in older adults (Nedeljko et al. 2022).

#### Research limitation

We limited the literature review to the results in English, which we assess as a limitation of the research. Although English is predominant in the research world, it can lead to bias, so relevant articles should be sought in other languages as well. This provides an opportunity for further research in this area.

## 5. CONCLUSION

The coronavirus pandemic has brought many changes to the daily lives of each of us. Older adults also experienced loneliness and poorer quality of life, mainly due to social

isolation. They were forced to use ICT due to remote health and social care. We find that there is a large digital divide between vulnerable groups, including older adults. On the one hand, older adults have acquired ICT competences and skills on their own or with the help of family members, and on the other hand, older adults are challenged by the use of ICT due to various reasons, such as low income, old age, inadequacy of ICT for older adults, and poorer digital literacy of older adults, including their exclusion from actual and virtual society due to digital illiteracy. Older adults who used ICT during the coronavirus pandemic thus reduced their feelings of loneliness and more easily overcame this difficult period.

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