

## REVIEWS

# The digital development within society that persons of 75 years and older in European countries have been part of: A scoping review protocol

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## ABSTRACT

Over the past decades countries of the world have experienced increase in the share of older people in demographics and the number is expected to rise even more. People are becoming more than ever dependent on digital technologies. The aim of this study is to map the body of literature concerning historical digital development over the last 20 years that people of 75 years and older in European countries have been part of. Moreover the goal is to identify research gaps in the existing literature in order to inform future research. The five-staged Arksey and O'Malley methodology framework is used to guide the scoping review process. Research strategy and eligibility criteria are defined. The study selection is made based on the eligibility criteria. A framework developed for the scoping review informs the charting of data from the included studies. Results will be summarized with criteria relevant for policy-makers, healthcare providers and the public.

**Key Words:** Older people, Europe, Digital technology, Telemedicine

## 1. INTRODUCTION

The world's population is ageing: virtually every country in the world is experiencing growth in the numbers and the population aged 65 and over is growing faster than any other age group.<sup>[1]</sup> In 2019 one in 11 people in the world were aged 65 or over, it is expected that by 2050, one in six people will be over 65 years old.<sup>[2]</sup> The number of persons aged 80 years or over is projected to triple between 2019 and 2050.<sup>[1]</sup>

Demographic changes are also leading to an ageing population in Europe.<sup>[3,4]</sup> In early 2018 almost one fifth of the total population living in the EU countries were older people, the relative share of people 65 years and older of the total population in 2050 is projected to reach 28.5%.<sup>[5]</sup> Today, in

Norway, over one in nine people are aged 70 years or older, this percentage is set to expand.<sup>[6]</sup> In Denmark the share of older people has noticeably increased during the last 10 years and in Sweden the largest demographic group growth in next decade is expected among older people.<sup>[7,8]</sup> The life expectancy in Nordic countries and other parts of Europe has increased over the past decades and is expected to rise continually.<sup>[5]</sup>

Population ageing is poised to become one of the most notable social transformations of the twenty-first century, with implications for many sectors of the society, including healthcare.<sup>[1,3]</sup> In addition to countries' healthcare systems, other sectors must respond by creating the environments that sup-

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port older people.<sup>[11]</sup> Observers argue that ageing in Europe provides a stimulus for developing new goods and services that also would be adapted to the needs of older people, as citizens expect to live increasingly long lives.<sup>[5]</sup>

Digital technologies are being used more than ever: there are benefits in different areas in daily life, the list is continually expanding.<sup>[9,10]</sup> Devices that would have been two decades ago regarded as science fiction are now often taken for granted.<sup>[11]</sup> Learning and using new technologies by the older people is seen as a demand for their integration in society.<sup>[12,13]</sup>

### 1.1 Background

Digitalization impacts older people, the existing literature shows that an age-related digital divide remains, people from 55 years and older lag behind in using and benefiting from IT in general.<sup>[14,15]</sup> A recent study about acceptance of mobile health applications (mHealth Apps) use among people with hypertension in Austria and Germany, showed that age has a negative association with the intention to use the Apps.<sup>[16]</sup> Similarly a research from the United Kingdom found that those using Smartphone Apps and Wearable Trackers were younger than those who did not.<sup>[17]</sup> A review study on internet use and the quality of life of the older people suggests that adults with a stronger social network can get help from younger generation, but those without that possibility cannot often keep up with the digitalization.<sup>[18]</sup> A research among adults from the United Kingdom proposes that Internet users, particularly 65 years and older, are less likely to feel lonely and have higher mental wellbeing scores.<sup>[19]</sup> It is found that internet usage can improve the quality of life by decreasing loneliness and integrating older people into society.<sup>[18]</sup>

The reality of the twenty-first century with societal digital demands see fostering digital literacy in the older people as a means to secure their needs and human rights.<sup>[13]</sup> The rapid development of information and communication technologies brings also wider use of homebased telemedicine.<sup>[20]</sup> Usage of telemedicine may benefit citizens with complex, multidimensional problems, as often occurs with many cases of older people.<sup>[21]</sup> In some cases telemedicine might replace face-to-face contact with health personnel, a study made in France showed that geriatric teleconsultations prevented hospitalization for 83.3% of cases.<sup>[22]</sup> In contrast a research from Sweden showed that telemedicine users visit the emergency room at least as often as other residents.<sup>[23]</sup>

The proportion of older people using Internet and digital devices has increased in recent years.<sup>[22]</sup> In Denmark the percentage of Internet usage in population in 2017 reached 97 percent and in Sweden and Norway in 2018 reached 98

percent.<sup>[8,25,26]</sup> But a high proportion of older people are still not experienced digital users.<sup>[24]</sup> In 2017 two fifths of people of 65 years and older in the EU 28 countries had never used a computer.<sup>[8]</sup>

In the European Region health ministries are increasingly investing in digitalization.<sup>[27]</sup> European national healthcare systems have started to move towards a provision which includes services offered by digital means, like accessing personal health records, scheduling medical appointments on the web and communicating remotely with care providers.<sup>[28]</sup> A program analysis between 2014 and 2016 in Austria, Croatia, Germany, Hungary, the Netherlands, Norway and the United Kingdom showed that it is widely accepted that the evolution of digital health tools alongside clear policies toward their adoption will facilitate regional uptake and scale-up of services with embedded digital health tools.<sup>[29]</sup>

The Danish Digital Health Strategy 2018-2022 focuses on digitalization and the use of health data in context of prevention, care, and direct treatment.<sup>[30]</sup> The Norwegian digitalization strategy for 2017-2022 aims for the citizens to have easy and safe access to healthcare services.<sup>[31]</sup> Norwegian citizens should have one digitalized patient journal with all the information about one's health, easy access to E-prescription, E-consultation, access to see and book available doctor appointments, get information about patient rights and available healthcare services.<sup>[32,33]</sup> Sweden's vision for eHealth in 2025 overall goal is to be the leader in using eHealth to make it easier for all the citizens to achieve good and equal health and welfare, and to strengthen their own resources for participation in the life of society.<sup>[34]</sup>

In Europe older people are expected to embrace such technological shifts in healthcare just as much as other age groups.<sup>[35]</sup> The rapid development of information and communication technologies and the use of homebased telemedicine brings new advantages but new challenges as well.<sup>[20]</sup> There exists reviews from Europe concerning telemedicine and older people: one review study about telehealth initiatives in palliative care in the United Kingdom aimed to scope the information available from published and unpublished research, with particular reference to older people.<sup>[36]</sup> another review study about the different technological solutions conceived for patients suffering from Alzheimer's disease and their caregivers.<sup>[37]</sup> Both studies were published in 2011.<sup>[36,37]</sup> As telemedicine develops rapidly, up to date research is needed.<sup>[20]</sup>

Scoping studies can be useful to map the body of literature, clarify key concepts and identify knowledge gaps in the evidence.<sup>[38,39]</sup> Such research will raise understanding, about what older people have experienced about using new devices,

as society has developed digitally.

## 1.2 Study objective

This study aims to map the body of literature concerning historical digital development over the last 20 years that people of 75 years and older in European countries have been part of. The purpose is to address main barriers and facilitators of the societal digital demands that older people have experienced. To know the aged citizen's acceptance and potential for entering the digital society, will inform both authorities, system developers, healthcare providers and the public in order to improve development of future systems and thereby the inclusion of aged population in the digital context. This knowledge can be useful concerning digital strategies for use in healthcare services. Moreover the goal is to identify research gaps in the existing literature in order to inform future research.

In this scoping review, we consider studies that include a population of 75 years and older at the time of the study. The concept of included studies cover telemedicine, communication technology and digital devices. The context of included studies is Europe and participants own home or home surroundings.

## 2. METHODS AND ANALYSES

A framework proposed by Arksey and O'Malley will be used to guide this scoping review process.<sup>[40]</sup> The original framework has been further developed by Levac and colleagues<sup>[41]</sup> and the Joanna Briggs Institute.<sup>[42]</sup> The review process includes 5 stages: identifying the research questions, identifying relevant studies, study selection, charting the data, collating, summarizing and reporting the results.<sup>[40]</sup>

### 2.1 Identifying the research questions

Arksey and O'Malley propose that an iterative process is required in order to formulate research question(s).<sup>[40]</sup> Research questions for this study are developed through an iterative process and familiarizing with the literature. The participants in this systematic scoping review are European citizens (+75). The concept of investigations is their experiences concerning digital demands. The context of the review is older people's own home. This review is guided by a main broad research question:

*What is known from the literature about what citizens of 75 years and older in European countries have experienced, as society has developed digitally (1998-2018)?*

Furthermore, two secondary research questions are used to guide this review:

*What are the main barriers for people of 75 years and older*

*in European countries concerning societal digital demands? What are the main facilitators for people of 75 years and older in European countries concerning societal digital demands?*

### 2.2 Identifying relevant studies

According to Arksey and O'Malley,<sup>[40]</sup> the criteria in use for identifying relevant studies is developed by the team of researchers in collaboration with an experienced university librarian. The scoping review include published studies retrieved from the following electronic databases: MEDLINE via Pubmed, Scopus, CINAHL and Embase. The keywords to be used during the search are shown in Table 1. We use English search terms in the strategy. The specific terms may change slightly depending on the database, however, the main keywords will be used throughout. Boolean logic that contains combination of MeSH Terms and Text Words will be used.<sup>[43]</sup> Detailed search strategy for MEDLINE via Pubmed is seen in Appendix 1.

This scoping review will include primary research studies with different study designs: qualitative studies, quantitative research and mixed method research. As recommended by the Johanna Briggs Institute,<sup>[42]</sup> unpublished literature will be included. Text (e.g. government recommendations and political documents) and opinion papers will be excluded. Papers published between 1998 and 2018 will be included. This period is chosen because digital development has spread rapidly during the last two decades.<sup>[10,44]</sup> European Parliament<sup>[45]</sup> claims that since 1st of January 1998, when opening up of the telecommunications market to full competition in Europe and the beginning of its implementation, a key priority of the European Union has been a Europe fit for the digital age. Selected publications must include persons of 75 years and older. From these, publications that include digital demands and communication technology in European countries are selected. It is important not to overlook non-English research.<sup>[46]</sup> Articles in Danish, English, Estonian, Finnish, German, Norwegian, Russian and Swedish will be considered for inclusion in this review.

As recommended by the Joanna Briggs Institute,<sup>[42]</sup> a three-step search strategy will be used. It will start with an initial limited search of CINAHL and MEDLINE (via PubMed). Terms for that will be chosen in collaboration with the university librarian to retrieve the maximum number of articles. A second search step will include exploration across all of the included databases using all the identified keywords. Eventually the reference list for all the identified articles will be studied for additional information.

**Table 1.** The keywords to be used during the search

	Population	Concept	Context
<b>Keywords:</b>	Aged	Digital demands	Europe
	Older	Digitalization	Homecare
	Senior	e-Health	Home setting
	75	Telemedicine	Outside
			Own home
<b>Headings</b>	Aged	Assistive technology	Europe
<b>(CINAHL):</b>	Aged, 80 and over	Computer Communication	Home care
	Aging	Networks	Home health care
	Geriatric	Digitizers/ES	
		Technology/ES	
		Telecommunications	
		Telecommuting	
		Telemedicine	
<b>MeSH terms</b>	Aged (65-79y)	Digital assistant	Europe
<b>and keywords</b>	Elderly	eHealth	Home care
<b>(MEDLINE):</b>	Nonagenarian (90-99y)	Mobile Health	Home care services
	Octogenarian (80-89y)	Telehealth	Home health nursing
	Oldest old (80y+)	Telemedicine	Home nursing

**2.3 Study selection**

A two-part study selection process will be used 1) a title and abstract review 2) full-text review. The inclusion and exclusion criteria will be tested on a sample of abstracts before conducting the search. The literature search results will first be retrieved from each database and imported into a reference management software. Duplicates will be removed. All the articles which are considered relevant will be included in the full-text evaluation. All known studies identified by the comprehensive literature search are reported only once.

**2.4 Charting the data**

The fourth stage of Arksey and O’Malley scoping review methodology is the charting of the data of the selected articles.<sup>[40]</sup> A data extraction form will be developed Table 2. It will be used to assess the full study articles retrieved from the literature fulfilling the eligibility criteria for inclusion. The data extraction form will be piloted before conducting the actual searches. The draft data charting tool will be modified and revised as necessary while extracting data from each included study. Where relevant, the authors of primary studies will be contacted for further information.

**Table 2.** Data charting form

Authors	
Title	
Journal	
Year of publication	
Country	
Study population	Age, background, other characteristics (e.g. disability)
Setting	
Methodology	
Aim of the study	
Type of digital tool/telemedicine/digital demands described	
Reported outcomes	
Facilitators	Describe the factors that made using digital tools/eHealth easier
Barriers	Describe the factors that made using digital tools/eHealth harder

## 2.5 Collating, summarizing and reporting the results

The analyzes of data collected using the data extraction framework will provide information on the body of research concerning historical digital development over the last 20 years that people of 75 years and older in European countries have been part of. The data extracted from the studies will be mapped and presented in the form that will reflect the objectives of this scoping review. The narrative description of data will be presented according to experiences, facilitators and barriers concerning the use of technology and telemedicine. Tabular representations of the data will be used to illustrate the identified results and will be supported with description of the data. A narrative summary will be used to answer each review question and will include commentary on the consensus between studies and gaps in knowledge. Results will be summarized with criteria relevant for policy-makers, healthcare providers and the public. This scoping review is a first part of the study that aims to address the barriers and facilitators of the societal digital demands and needs in healthcare services in citizens 75 years and older in Norway. The scope of research will be followed by another part of the study that will collect data by the use of interviews and theoretical investigation of documents by the Norwegian Ministry of Health and Care Services that will be contrasted by the strategies from similar countries (Denmark and Sweden).

## 3. ETHICS AND DISSEMINATION

Since the scoping review methodology aims to synthesize information from available publications, this study does not require ethical approval. An article reporting the results of the scoping review will be submitted for publication to a scientific journal and presented at relevant conferences. The results of this review will provide an overview of the field that will help system developers and healthcare providers to improve future system development and thereby the inclusion of aged population in the digital context, furthermore the results will help to guide future research.

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## CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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