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Barriers for Older Adults to Preventing Their Engagement in the Digital World: A Scoping Review

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Abstract:

Fundamental transformation in the digital technologies restructured the access to essential services and social connections, established significant challenges for older adults worldwide. This scoping review study systematically examined barriers preventing older adults aged 60 and above from engaging with digital world. This study follows framework developed by Arskey and O' Malley and later refined by Levac, Colquhoun, and O' Brien, findings were reported by using PRISMA extension which usually adopted for scoping reviews. A thorough search across five databases produced 20 peer-reviewed research articles published between 2014-2025. The Scoping review included research from 11 countries over Aisa, Europe, North America, and Oceania, analyzing the data from various methodological approaches like cross sectional survey, mixed method designs, focus group discussions, were summed up qualitatively. From the analysis there were seven fundamental barrier categories surfaced: Technological barriers, skill and knowledge barriers, social barriers, physical, health and sensory barriers, economic barriers, psychological barriers, and environmental barriers. Evidence-based key intervention strategies identified contains individualized training approaches, digital literacy programs, universal design principles, community technology centres, peer mentorship networks and infrastructure investment. The findings shows that fruitful digital inclusion needs encompassing multi-dimensional key interventional strategies addressing training, affordability, accessibility, at the same time ongoing support systems.

Keywords: *Digital sphere, Engagement, Strategies, Physical limitation and Social pressure*

Introduction

The swift digitalisation of the world has essentially redefined how people access basic services, establish social connections and partake in economic

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activities. To survive in this digital world individuals must adhere to digital technologies for regular communication, to access information and healthcare services. Because digitalisation caused new forms of social stratification based on digital literacy and technological engagement. As a demographic group older adults face complex challenges in managing the technological environment, often resulting deprivation from digital benefits and services.

Presently, ageing population facing both advantages and disadvantages for initiatives under the digital inclusion. According to the World Health Organization proportion of ageing population projects that the aged 60 and above will raise to approximately 2.1 billion people means 12% to 22% globally by 2050. (World Health Organisation, 2022). This demographic shift with unconventional technological advancement, creating a desperate need to understand and address the barriers that prevent older adults from engaging in the digital world.

Prior research has shown that multifaceted dimensions of digital exclusion concerning the older adults individuals, comprising technological barriers, skills and knowledge barriers, social barriers, physical, health and sensory barriers, economic barriers, psychological barriers, environmental barriers. At the same time, the fragmented nature of this research has intervened in comprehensive understanding of the barrier landscape that older adults face when trying to involve themselves with digital technologies.

Scoping reviews provide a methodologically sound approach to framing the breadth of evidence across distinct research contexts and distinguish knowledge gaps in complex and multi-dimensional research areas. Scoping reviews offer a comprehensive overview of prior research, clarify concepts, understand the scope of evidence and help in assessing the quality and nature of research within a field.

Methodology:

Study Design

A scoping review was performed to outline the literature to understand the present practices and to build the evidence for guiding future directions. The framework developed by Arskey and O' Malley (Arksey & O'Malley, 2005) and later refined by Levac, Colquhoun, and O' Brien (Levac et al., 2010) was followed, and reporting of the findings were according to the PRISMA extension for scoping reviews. This scoping review explores a wide range of related literature, thus providing information to researchers, practitioners related to instructional strategies for older adults learning. Five methodological steps which are a) Identifying the research questions b) identifying relevant studies c) study selection d) Charting the data e) collating, summarising, and reporting the results

were followed during the completion of this scoping review paper.

Figure 1 Methodological Framework

Stages of Arskey and O'Malley Framework

Stage 1: Identifying the research questions

Researcher conducted a comprehensive and extensive review of the existing literature, through this process it became clear that numerous studies have addressed the aspects of digital inclusion, while significantly the challenges or barriers were underexplored regarding older adults. Based on these understanding and the identified research gap, the following research questions were formulated: 1) Which barriers have been identified from past researchers as limiting the participation of older adults in the digital sphere, and how can these barriers be categorized? and 2) What were the key strategies that have been obtained by past researchers regarding the barriers which helps to preventing older adults engagement in digital world?

Stage 2: Identifying relevant studies

Text box 1. Scoping review keywords

Population (Older adults above 60 years of age).

Older Adults, Senior citizen, older adult, pensioner, retire, aged 60 and above, ageing, geriatric.

Concept (Barriers for older adults in the digital world)

Technological barriers, skills and knowledge barriers, social barriers, physical, health and sensory barriers, economic barriers, psychological barriers, environmental barriers.

Context (Barriers for Older adults in the digital world which prevents their free and fair engagement)

The digital world indicates contexts like home, community, health, social, or service environments where digital engagement occurs.

Stage 3: Study Selection

A comprehensive search across five databases provided a substantial pool of articles, which were first imported and eliminated redundant studies using Zotero software to ensure a unique dataset for consideration. Subsequently, titles and abstracts were systematically screened to identify studies and determine to which studies to be reviewed. Final study selection was governed by a prior inclusion and exclusion criteria, applied consistently to ensure transparency, reproducibility, and methodological rigor throughout the review process.

Table 1: below shows the inclusion and exclusion criteria that were followed during this process.

Inclusion Criteria:	Exclusion Criteria:
Studies focusing on adults aged 60 years and above	Research not specifically addressing barriers to digital engagement
Peer-reviewed articles published in English	Non-English language publications
Studies addressing social, physical, technological, attitudinal, economic, or cognitive barriers	Research focusing solely on digital interventions without addressing barriers
Studies conducted within 2014-2025	Research not specifically addressing barriers to digital engagement

Charting the data:

Once the studies that fit the inclusion criterion have been shortlisted, the studies were brought to the next stage, where data abstraction will be carried out. And a descriptive-analytical narrative method was used to extract and chart the data from the articles, which were finally selected in Stage 3 of methodology. Referring to the data which includes the author(s) name and year of publication, the country of the author and study design target users sample/sample size, age of the respondents, and the key barriers were identified and organized in a summarization table.

Collating, summarizing, and reporting the results:

Thematic constructs were derived from the qualitative analysis of the selected literature. Codes were used during this iterative process of qualitative content review to derive sub-themes and key-themes related to the study's research question.

Data Analysis: Data analysis was conducted using descriptive qualitative content analysis of the selected literature (20 included studies). Results were reported using the PRISMA extension for scoping reviews (PRISMA-ScR) checklist (Tricco et al., 2018).

Results:

Search and screening results:

The database search resulted in 3084 articles; the Zotero software removed 2507 duplicate articles. Of the remaining 577 articles, screened by reviewing title and abstracts, another 200 were excluded through independent review followed by the consensus of all the reviewers, leaving a total of 377 articles. The full text of 300 articles was not retrieved, resulting in 77 articles assessed for eligibility by full text. Another 57 articles were removed as they did not match the inclusion criteria. Hence, the review finally included 20 studies (Figure 2).

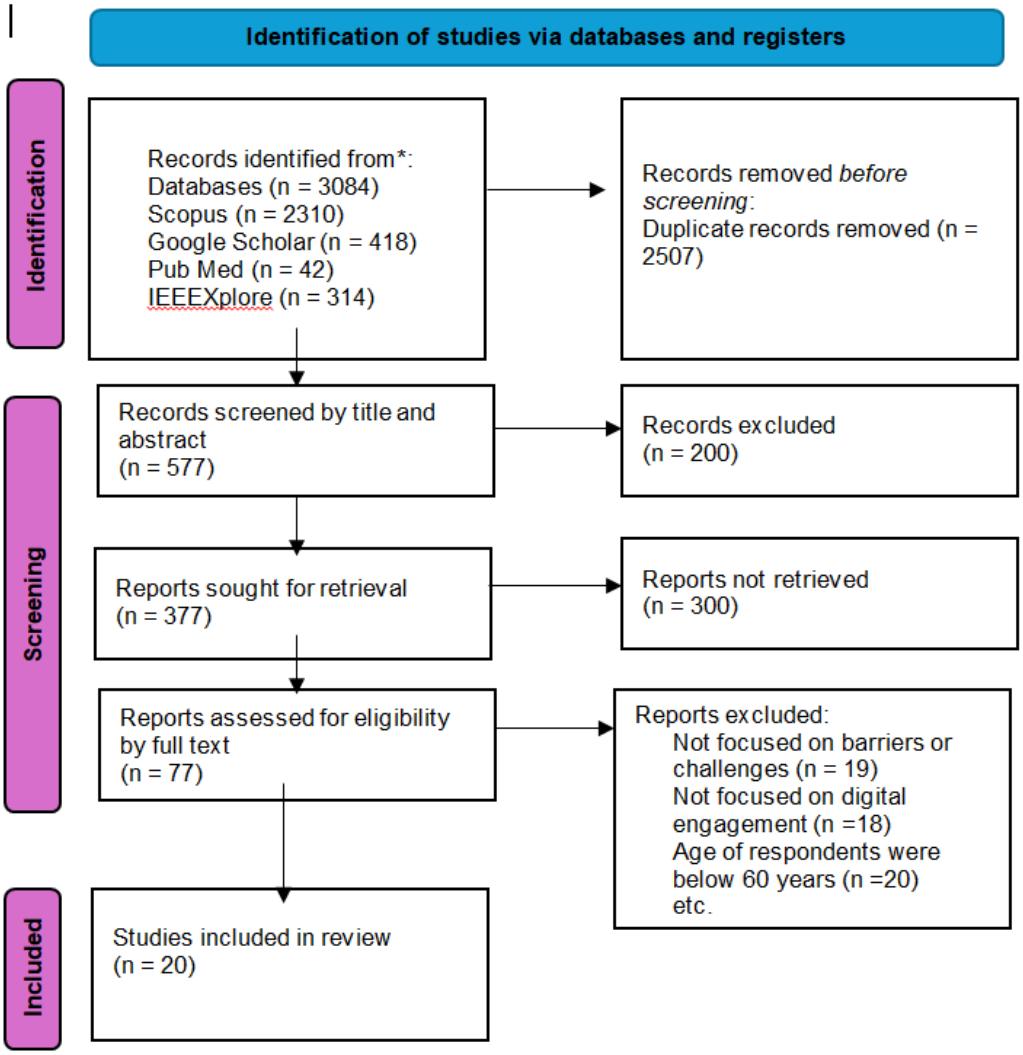

Figure 2. Flow diagram of the study selection process

Characteristics of Source documents:

Of the 20 studies included, 6 were from Asia (China = 4, India = 1, Singapore = 1), 10 from Europe (United Kingdom (UK) = 4, Switzerland = 2, France = 1, Lithuania = 1, Norway = 1, Sweden = 1), 3 from North America (United States of America (USA) = 3), and 1 from Oceania (Australia = 1).Figure 3 depicts the graphical representation of the country distribution of publications.

Figure 3: Country-wise distribution of publications

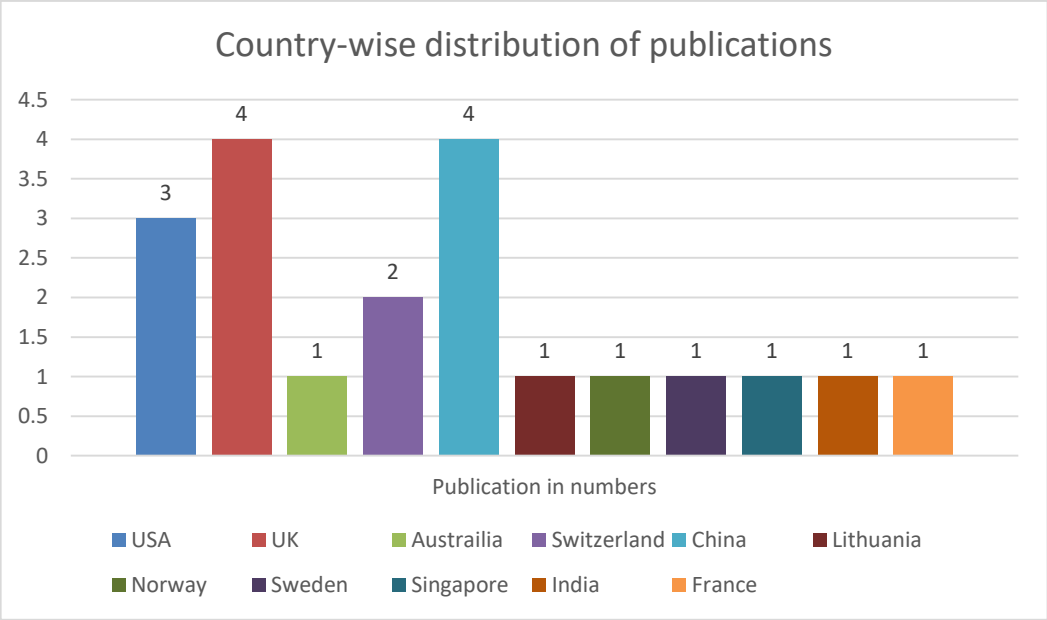

Figure 4: Number of articles published by year-wise distribution

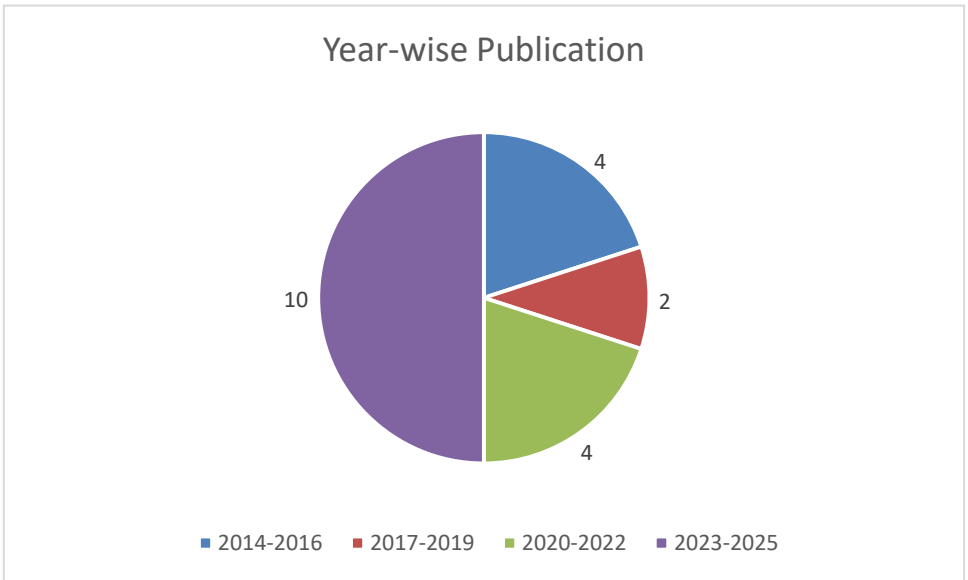

Figure 4 depicts the number of articles published by year. Publications in the table span 2014–2025, and when grouped into consecutive three-year periods they increase from 4 (2014–2016) and 2 (2017–2019) to 4 (2020–2022) and 10

(2023–2025), demonstrating clear growth in output on older adults' digital barriers over time. For the specific window 2023–2025, the dataset contains 10 articles, still evidencing a pronounced surge in the early 2020s.This shows growth in the field of the barriers for older adults in the digital world.

Outlines the description of the studies included in the review

Name of the Author and Year of publication	Country	Study design	Sample	Barriers
Chaiwoo Lee and Joseph F. Coughlin (2014)	USA	A Qualitative systematic review protocol	Not specified	Health and Sensory Barriers, Psychological and Emotional Barriers, Skills and Knowledge Barriers, Economic and Resource Barriers, Environmental Barriers, Cognitive Barriers.
Huei Wu Y., et al., (2015)	France	Qualitative, exploratory study with semi-structured interviews	20 participants	Psychological Barriers, Environment Barriers, Health and sensory Barriers.
Alexander JAM van Deursen, Ellen J Helsper 2015	UK	Multicohort Longitudinal Analysis	1,08,621 across 5 cohorts	Economic and Resource Barriers, Environment Barriers, Skills and knowledge related Barriers.
Yusif, S., et al., 2016	Australia	Scoping review	22 studies	Economical Barriers, Skills and knowledge related Barriers, Environment Barriers.
Alexander Seifert et al., 2018	Switzerland	Representative cross sectional telephone survey	1037 older swiss residents	Skills and Knowledge related Barriers, Environment Barriers, Cognitive Barriers.

Mitzner T., et al., 2018	USA	Special article/narrative synthesis	Not specified	Economic Barriers, Skills and Knowledge Barriers, Cognitive Barriers, Usability and Privacy Barriers, Health and Sensory Barriers.
Seifert, Cotten, Xie 2020	Switzerland	PRISM trial	150 participants	Usability or Privacy Barriers, Cognitive Barriers, Economic Barriers, Psychological Barriers
Bin Hou et al., 2022	China	Quantitative study	3141 respondents	Social Barriers and Economical Barriers.
Hou et al., 2022	China	Cross-sectional survey	5,671 participants	Cognitive Barriers, Economic Barriers, Social Barriers.
Lu X., et al., 2022	China	Qualitative study	19 participants	Physical Barriers, Cognitive Barriers, Social Barriers, Environmental Barriers, Usability and Privacy Barriers.
Gedvilaite-Kordusiene & Rapoliene 2023	Lithuania	Mixed-methods approach	60 interviewees	Physical Barriers, Skills and Knowledge Related Barriers, Social Barriers, Environmental Barriers, Usability and Privacy Barriers.
Joranson N., et al., 2023	Norway	Quantitative observational study	3,141 participants	Psychological Barriers, Social Barriers, Skill and Knowledge Barriers.

Frishammar et al., 2023	Sweden	Mixed-method single-case study:	22 Interviews	Adoption and Affective Barriers, Usability and Privacy Barriers.
Wilson et al., 2023	UK	4-step systematic review	44 articles	Privacy, trust and functionality and cost and ease of use and suitability for daily use and fear of dependence and lack of training.
Morrison et al., 2023	UK	National telephone survey and nationally representative online survey	For Senior non-users: 221 participants and For Senior Internet users: 258	Affective Barriers, Psychological Barriers, Skills and Knowledge Barriers, Social Barriers, Usability and Privacy Barriers.
Li and Kostka, 2024	China	Non-representative online survey	289 respondents	Health and Sensory Barriers, Affective Barriers, Cognitive Barriers, Environmental Barriers, Social Barriers.
Lu et al., 2024	Singapore	Semi structured qualitative study	26 Interviews	Cognitive Barriers, Social Barriers, Security and Trust Barriers.
Money, A., et al., 2024	UK	Review method	59 articles	Psychological Barriers, Usability and Privacy Barriers, Environmental Barriers, Cognitive Barriers.

Yang et al., 2024	USA	Qualitative focus groups discussions with technology demonstrations; inductive thematic analysis	14 Focus Group Discussions	Skills and Knowledge Barriers, Affective Barriers, Usability and Privacy Barriers, Psychological Barriers, Environmental Barriers.
Gunjan Wadhwa et al. 2025	India	Qualitative study with online survey and follow-up interviews	102 participants total (93 survey respondents + 9 interview participants)	Intrinsic Barriers, Extrinsic Barriers, Psychological Barriers.

1) Which barriers have been identified from past researchers as limiting the participation of older adults in the digital sphere, and how can these barriers be categorized?

Regarding the types of barriers identified from past researchers preventing older adults engagement in the digital world, the results indicate that, technological barriers, skills and knowledge barriers, social barriers, physical, health and sensory barriers, economic barriers, psychological barriers, environmental barriers.

Technological barriers: Lack of access/devices/connectivity (Van Deursen & Helsper, 2015); internet connectivity (Yusif et al., 2016); reduced access (Seifert et al., 2018); non-use of internet (Mitzner et al., 2019) design and usability matches (Seifert et al., 2021); limited access in rural areas (Aggarwal et al., 2020); technological design incompatibility (X. Lu et al., 2022); usability (Hechinger et al., 2022); limited technical support, device comprehension issues (Li & Kostka, 2024); frequent changes in interface (S. Y. Lu et al., 2024); poor wi-fi access, usability issues, inflexible procedures (Wadhwa, G. et al., 2025); lack of devices (Li & Kostka, 2024);

Skills and knowledge barriers: Lack of technical skills, knowledge gaps (Lee & Coughlin, 2015); low literacy/skills (Van Deursen & Helsper, 2015); low digital skills/inexperience (Mitzner et al., 2019); limited prior experience(Seifert et al., 2021); language and literacy gaps (Aggarwal et al., 2020); language and literacy barriers (X. Lu et al., 2022); training (Hechinger et al., 2022); skills Deficit, training and support gaps (Mubarak & Suomi, 2022); information

reliability (Mubarak & Suomi, 2022); lack of digital skills (Rapolienė & Gedvilaitė-Kordušienė, 2022); low digital skills (Jøranson et al., 2023); lack of training(Wilson et al., 2023); traditional literacy (Morrison et al., 2023); language difficulties, technical jargon (Li & Kostka, 2024); low knowledge, need for tailored training/ongoing support (Yang et al., 2024); limited digital skills (Wadhwa, G. et al., 2025);

Social barriers: Social pressure or support (Lee & Coughlin, 2015); limited social support, weaker technological socialization among cohorts not raised with digital tech, creating risks of perceived social exclusion when not using the Internet, age related decline in social resources (Seifert et al., 2018); Digital gender divide, intergenerational disconnect (Aggarwal et al., 2020); lack of social participation and ability to access (Hou et al., 2022); social marginality (X. Lu et al., 2022); engagement (Hechinger et al., 2022); social factors, cultural and structural limitations (Mubarak & Suomi, 2022); lack of time, lack of social support, challenges from rapid digitalization (Rapolienė & Gedvilaitė- Kordušienė, 2022); limited social support (Jøranson et al., 2023); integrity worries (Frishammar et al., 2023); disinterest in digitalization (Frishammar et al., 2023); gendered norms, social context (Morrison et al., 2023); lack of mentors (Li & Kostka, 2024); lack of ongoing support (S. Y. Lu et al., 2024); social pressure/injustice related to “no alternative” digital access (Yang et al., 2024); digital exclusion (Wadhwa, G. et al., 2025);

Physical, health and sensory barriers: Health issues and sensory loss, personal factors (age, sensory limits) (Lee & Coughlin, 2015); age related decline in physical limitations (Seifert et al., 2018); physical limitations, discontinuation with frailty/advanced age(Mitzner et al., 2019); age-related physical decline (X. Lu et al., 2022); vision (Hechinger et al., 2022); health-Related Challenges (Mubarak & Suomi, 2022); physical barriers (Rapolienė & Gedvilaitė- Kordušienė, 2022); physical limitations (Jøranson et al., 2023); vision and health problems (Li & Kostka, 2024); age-related physical decline (Yang et al., 2024);

Economic barriers: cost/resources (Lee & Coughlin, 2015); affordability/costs(Van Deursen & Helsper, 2015); cost effectiveness (Yusif et al., 2016); increasing prevalence of online-only information/services and extra fees for offline options, age related decline in financial (Seifert et al., 2018); affordability of access/devices, lack of devices/connectivity (Mitzner et al., 2019); cost of devices and internet (Aggarwal et al., 2020); cost (Hechinger et al., 2022); equipment and infrastructure, economic constraints (Mubarak & Suomi, 2022); cost (Wilson et al., 2023); cost (Yang et al., 2024);

Psychological barriers: Digital disengagement, privacy concerns (Lee & Coughlin, 2015); computer anxiety,

reluctance to adopt, antecedents of adoption span usefulness, habits/frequency of use (Lee & Coughlin, 2015); refusal/low motivation (Van Deursen & Helsper, 2015); Privacy and trust (Yusif et al., 2016); lower motivation after retirement, age related decline in cognitive (Seifert et al., 2018); cognitive limitations(Mitzner et al., 2019); cognitive challenges (Seifert et al., 2021); technophobia and anxiety, low self-efficacy, perceived irrelevance, fear of scams and fraud, privacy concerns (Aggarwal et al., 2020); age-related cognitive decline (X. Lu et al., 2022); internalized ageism (X. Lu et al., 2022); cognition and confidence, privacy (Hechinger et al., 2022); psychological factors, trust (Mubarak & Suomi, 2022); lack of motivation, privacy concerns (Rapolienė & Gedvilaitė- Kordušienė, 2022); low motivation, fear/anxiety about technology (Jøranson et al., 2023); channel-specific trust differences, technological anxiety during use, trust concerns (Frishammar et al., 2023); negative attitudes, fear of making mistakes (Frishammar et al., 2023); privacy, trust, fear of dependence (Wilson et al., 2023); attitudes and anxiety, Feeling too old, limited experience/self-efficacy, safety, privacy and trust, perceived need (Morrison et al., 2023); emotional barriers (fear, insecurity), learning difficulties (memory, slower perception) (Li & Kostka, 2024); fear of scams, fraud, preference face to face interaction and generational beliefs and self-perceptions(S. Y. Lu et al., 2024); low comfort/control, low cognitive decline, technology anxiety, privacy/security concerns, stigma of gerontechnologies (Yang et al., 2024); reluctance to use technology, self-directed ageism (Wadhwa, G. Et al., 2025);

Environmental barriers: Context barriers (Lee & Coughlin, 2015); living arrangement (Morrison et al., 2023);

RQ 2: What were the key strategies that have been obtained by past researchers regarding the barriers which helps to preventing older adults' engagement in digital world?

Technological Barriers:

Evidence-based interventions addressing digital exclusion barriers include community technology centres, universal design principles, comprehensive digital literacy programs, infrastructure investment. Effective strategies simultaneously address access, affordability, interface design, training, and ongoing support systems. Digital engagement represents a multi-dimensional scale requiring individualized approaches for sustainable inclusion among older adults.

Skills and knowledge Barriers:

Effective digital literacy interventions comprise structured 6–14 week programs utilizing step-by-step instruction, visual aids, and multilingual curriculum. Key components include peer mentorship, memory enhancing techniques, neighbourhood services, smart phones or

tablet provision, and ongoing technical support. Successful approaches integrate individualized instruction, confidence-building strategies, cybersecurity education, and peer alumni networks.

Social Barriers:

Effective interventions encompass anti-ageism education, inter-generational bridge programs, peer support networks, and culturally responsive training approaches. Additional strategies include gender-inclusive methodologies, continuous mentorship systems, technology buddy networks, and community-based programs utilizing trusted organizations. These interventions emphasize social benefits while demonstrating technology as supplementary to face-to-face connections rather than replacement mechanisms.

Physical, health, and sensory barriers:

Effective interventions encompass visual accommodations through screen magnification software, high-contrast colour schemes, and adjustable fonts (12-16 point), hearing support via closed captioning and voice interaction technologies, motor accommodations using larger touch targets and haptic feedback systems, cognitive support through simplified navigation, and personalized multisensory interfaces reducing healthcare burdens by 35%.

Economic Barriers:

Effective interventions include subsidy programs regarding internet rates, broadband connectivity, vouchers for technology to older adults. Community-based solutions like program on digital devices lending, mobile access units, comprehensive approaches incorporate public-private partnerships (PPP), intergenerational cost sharing arrangements, adaptable payment systems, and shared ownership models reducing individual costs.

Psychological Barriers:

Comprehensive psychological interventions include gradual exposure protocols reducing anti-ageism programs challenging notions, confidence building interventions using peer role models, technophobia, awareness programme on cybersecurity addressing trust issues, personalized relevance approaches connecting skills to goals and peer support networks. Successful interventions employ holistic approaches simultaneously addressing anxiety, confidence, and security.

Environmental Barriers:

Comprehensive environmental interventions address context barriers through home environment modifications including dedicated technology spaces with appropriate lighting and ergonomic seating, smart home integration utilizing voice-activated controls reducing cognitive burden, and ergonomic technology placement employing adjustable mounting systems and strategically located charging stations accommodating older adults' physical

needs while maintaining user independence.

Limitations:

Current study may have some limitations must be acknowledged. The study excluded the existing literature which published in languages other than English. Researcher avoided the unpublished and not peer reviewed studies. Due to qualitative assessment researcher had a limited opportunity. This study addressed barriers which prevents older adults engagement in digital world on broader aspect whereas future studies may address the individual barrier.

Conclusion:

This scoping review systematically addressed the barriers preventing the engagement of the older adults in the digital world. Through analyzing the 20 peer-reviewed existing literature published between 2014-2025. This scoping review addressed significant research questions relation to identifying barriers, categorizing them, and key strategies for ensuring older adults' engagement in the digital world.

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