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Barriers and facilitators of digital interventions use to reduce loneliness among older adults: a protocol for a qualitative systematic review

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ABSTRACT

Introduction Digital interventions are considered as a potential solution to loneliness in older adults. However, this type of intervention has had limited acceptance among older adults (aged ≥60 years). To ensure the use of digital interventions in older adults, possible barriers and facilitating factors should be better understood from the user's perspective. We aim to systematically examine the barriers and facilitators to the implementation of digital interventions designed to reduce loneliness in older adults by identifying, evaluating and synthesising qualitative studies.

Methods and analysis A comprehensive search of qualitative studies for barriers and facilitators for use of digital interventions will be conducted in the following databases: PubMed, MEDLINE, CINAHL, Embase, Scopus, Cochrane Library and Web of Science. Studies reported in English will be considered for this review. Grey literature will not be included. Two reviewers (HZ and XL) will independently screen the literatures, and any differences will be solved by turning to the third reviewer (JN). The Joanna Briggs Institute (JBI) Qualitative Research Critical Appraisal Checklist will be used by two reviewers to independently assess the validity of the methods used. Relevant data about the populations, context, culture, geographical location, study methods and barriers and facilitators to the implementation of digital interventions will be extracted using the JBI standardised data extraction tool. JBI meta-aggregation methods will be implemented to synthesise the data, which will generate themes and categories based on the data. The final synthesis will establish confidence levels using the JBI ConQual approach.

Ethics and dissemination The protocol does not require ethical approval. The data are based on published scientific databases. The results will be disseminated through journal articles and scientific conference presentations (if feasible).

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STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ We designed the protocol based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols guidelines.
⇒ Two reviewers will conduct study identification and data extraction independently, in order to minimise selection and reviewer bias.
⇒ The inclusion of only English-language publications may lead to cultural and publication bias.
⇒ Meta-synthesis of qualitative studies does not analyse the primary data, the synthesis relies on a sample of data extracted by the study team.

INTRODUCTION

Loneliness among older adults is a growing global concern.[1] It has been estimated that the global prevalence of loneliness among older adults ranges from 4.2% to 24.2%.[2] Loneliness has likely increased during the COVID-19 pandemic as a result of lockdown and quarantine measures implemented.[3 4] Loneliness is an involuntary, unpleasant subjective experience that occurs when the quantity and/or quality of a person's actual social network falls short of their expectations or needs.[5–7] Another similar term is social isolation, which is an objective state that develops as a result of a lack of social contact with relatives or non-relatives.[8 9] However, not all people in social isolation feel lonely, some people with large social networks still feel lonely.[10 11]

Loneliness has serious implications for physical health, mental health and well-being. Among older adults, loneliness has been linked with adverse physical conditions, such as cardiovascular disease and stroke,[12] and mental health conditions including cognitive decline,[13] dementia,[14] depression,[15] anxiety,[16] suicidal ideation and suicides.[17] Recent evidence indicates that loneliness significantly adds to the cost of quality of life and health services,[17] with the impact of severe loneliness equating to at least £9537 per person per year (and possibly as much as £17 043).[18] Therefore, addressing loneliness in older adults is imperative.

The WHO has recommended digital interventions as a solution to loneliness in older adults.[19] With the popularity of digital technology and the increasing use of digital devices by older adults,[20] digital interventions not only serve as platforms to provide more social opportunities for older adults and facilitate communication and participation in social interaction.[21 22] Moreover, the combination of digital technology and social interventions alleviates older adults' loneliness by changing adverse physical conditions and submitting social skills.[23–25] Compared with non-digital interventions, digital interventions show potential for helping older adults make social connections,[26] especially those with limited mobility and those living alone or in rural areas.[27] Recently, digital technologies have been well implemented during the COVID-19 pandemic and further recommended by Shah *et al* in addressing loneliness.[28]

We systematically searched the PubMed database for current literatures without language or year restrictions, using the terms 'loneliness', 'older adults', 'intervention' and 'systematic review'. We identified 28 reviews of digital interventions, including 10 scoping reviews,[29–38]11 systematic reviews (including 7 meta-reviews),[22 30 39–47] 2 narrative reviews,[48 49] 2 rapid reviews,[50 51] 1 umbrella review,[52] 1 mini-review[53] and 1 systematic review of systematic reviews.[54] The majority of the reviews aimed to explore the effectiveness of several or all of the digital interventions on reducing loneliness.[31 35 36 39 40 45 47–49 52 53] The scoping reviews also focused on the classification and mechanisms of action of digital interventions.[29–38] Although most reviews found the effectiveness of digital interventions, most digital intervention techniques are not tailored for older adults.[40 55 56] The 'heterogeneity' of older adults, such as declining cognitive and sensory abilities, can make them face barriers that do not easily allow them to use digital technologies.[57–59] In addition, high costs,[58 60] privacy issues,[58 61] internet connectivity and workflow are also factors that are barriers to the implementation of digital technologies in older adults.[58 61–63] Currently, two scoping reviews have summarised the barriers and facilitators to the use of two robotic interventions in reducing loneliness in older adults, but there are a lack of summarised evidence of the reasons for the success and barriers of digital interventions aimed at reducing loneliness in older adults.[37 52 64]

Quantitative studies about digital interventions can determine whether interventions are effective, whereas qualitative studies are better suited to identify perceptions, beliefs, barriers and facilitators about the digital interventions.[65 66] However, qualitative studies are typically small in size and based on sample information for different purposes.[67] Systematic reviews of qualitative studies can aggregate and analyse findings from different settings and provide valuable information for intervention development and implementation.[68 69] Therefore, this review aims to explore the barriers and facilitators in the implementations of digital interventions to reduce loneliness in the elderly, through a qualitative systematic review.

Objectives

The purpose of this qualitative systematic review is to synthesise and critically assess the results of published qualitative studies on digital interventions to reduce loneliness among older adults. The following two research questions will be addressed:

1. What are the facilitators in the implementation of digital interventions to reduce loneliness in older adults?
2. What are the barriers in the implementation of digital interventions to reduce loneliness in older adults?

SYSTEMATIC REVIEW REGISTRATION

This protocol has been registered in the PROSPERO database (www.crd.york.ac.uk/prospero/), which is International Prospective Registration of Systematic Reviews, on 16 August 2022, with the registration number, and it can be accessed online at https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=328609.

METHOD AND ANALYSIS

Design

This study is scheduled to begin on 15 January 2023.[70] We will use a qualitative systematic review approach to synthesise the evidence in this review. The qualitative systematic review is useful for our purposes because it is interpretative in broadening the understanding of a particular phenomenon.[71] We will report results based on the Joanna Briggs Institute's (JBI) meta-synthesis approach,[72] where included studies are categorised based on similarity of significance.[73] Our review focuses on summarising existing perspectives rather than validity, and the approach aims to generate a new, comprehensive and integrated interpretation of qualitative findings that is more substantive and meaningful than individual investigations.[74]

To ensure transparency and completeness of reporting, this review is designed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P),[75] which is given as online supplemental appendix 1, and the Enhancing Transparency in Reporting the Synthesis of Qualitative Research statement.[76]

Inclusion and exclusion criteria

Participants

We will include studies involving male and female older adults ≥60 years old.[77 78] If the study involves participants under and over 60 years of age, two requirements need to be met at the same time to be included: (1) The study includes more than 50% of participants aged 60 and over, (2) the study's results are age related. Older adults with multimorbidity (eg, with diabetes, cancer, depression, cardiovascular disease, stroke, angina, physical injury) will be included as long as the study's focus is loneliness.

Studies reporting physical condition without a focus on loneliness will be excluded.

Intervention

In this review, digital interventions are defined as interventions that apply digital technologies, such as devices and applications, that process information in the form of digital codes (usually binary codes).[79] We will include studies where different types of digital applications or web-based social networking tools have been used, such as social networking sites, video communication, online discussion groups and forums, telephone dating, messaging services, chatbots, artificial intelligent (AI), sensors, robots and Internet and computer-based training.[17 54 80–83]

Phenomena of interest

The phenomena of interest in this review will be the barriers and facilitators to the implementation of digital interventions dedicated to reducing loneliness in older people. A *barrier* is an obstacle to the implementation of an electronic intervention for loneliness among older adults; barriers may include factors, issues or themes in the design, personal, social, environmental or policy levels of the relevant electronic device.[84] A *facilitator* is a mechanism of the design of the relevant electronic device, older adults, stakeholders, service providers or policymakers that contributes to the effectiveness of an electronic intervention for loneliness among older adults.[85]

Context

We will make no restrictions on the setting. We will include communities, nursing homes, convalescent centres and hospitals in different regions and countries.

Types of studies

Eligible studies will be reports of original research, peer-reviewed articles with a qualitative component pertaining to barriers and facilitators of digital interventions for loneliness among older adults, including, but not limited to, designs such as ethnography, action research, case studies, implementation studies, qualitative process evaluation and qualitative interviews with stakeholders.[71 86]

Time frame

The search will be limited to English-language peer-reviewed articles published as early as 1 January 2010 to 15 January 2023.[70] As the field of digital health technology is rapidly moving forward, this review is intended to capture the most current information available. At the beginning of 2010, the development of disruptive technologies began to show a high rate of growth, and their integration in healthcare became increasingly rich.[42 87]

Language

This review will include articles published in English.

Publication status

Only peer-reviewed, published full-text articles will be included in this review. Grey literature such as conference papers, dissertations, books and book chapters, letters, editorials and research proposals will be excluded.

Search strategy

The search strategy was developed in collaboration with a medical librarian. A three-step search strategy will be used in this paper.[73] First, we will develop initial keywords based on domain knowledge and perform an initial search of PubMed. A comprehensive search strategy will be constructed for each of the included databases based on the text words contained in the titles and abstracts of the papers searched as well as the index terms used for the bibliographic databases. The initial keywords we used included: 60 years*, older*, elder*, age*, senior*, ageing, aging, or other words describing people aged 60 years or more; digital intervention, technol*, sensor*, robot*, internet*, computer*, electronic*, or other words describing interventions that apply digital technologies; loneliness, alone*, singleness*, or other words describing a state of feeling sad or depressed due to lack of companionship or separation from others; “barriers”, and its synonyms (eg, impairment, obstacle, problem, limitation, challenge, impediment, and other similar terms); “facilitators”, and its synonyms will be used (motivator, support, enabler, advancement, and other similar terms). Second, specific searches will be performed for the seven databases: PubMed, MEDLINE, CINAHL, Embase, Scopus, Cochrane Library and Web of Science. Third, the reference lists of all retrieved studies will be reviewed to search for any additional studies. An example of the complete search strategy for PubMed is detailed in online supplemental appendix 2.

Study records

We will use EndNote as our bibliographic software management platform. First, we will use EndNote to filter the titles and abstracts and remove duplicates. We will present flowcharts (figure 1) in the final publication, showing the results of each stage of the review and adhering to the PRISMA statement.[88]

Study selection

Two authors (HZ and XL) will independently review the titles and abstracts retrieved through the search strategy to determine what should be included in the full-text review. If both authors consider an abstract or title relevant, it will be included in the full-text review. Two authors will independently review the eligibility of all articles selected for the full-text review to reach consensus on inclusion. Any discrepancies will be resolved through discussion with the third author (JN). Reasons for the ineligibility of any excluded articles will be recorded.[75]

Assessment of methodological quality

Two reviewers (HZ and XZ) will use the JBI Qualitative Assessment and Review Instrument independently

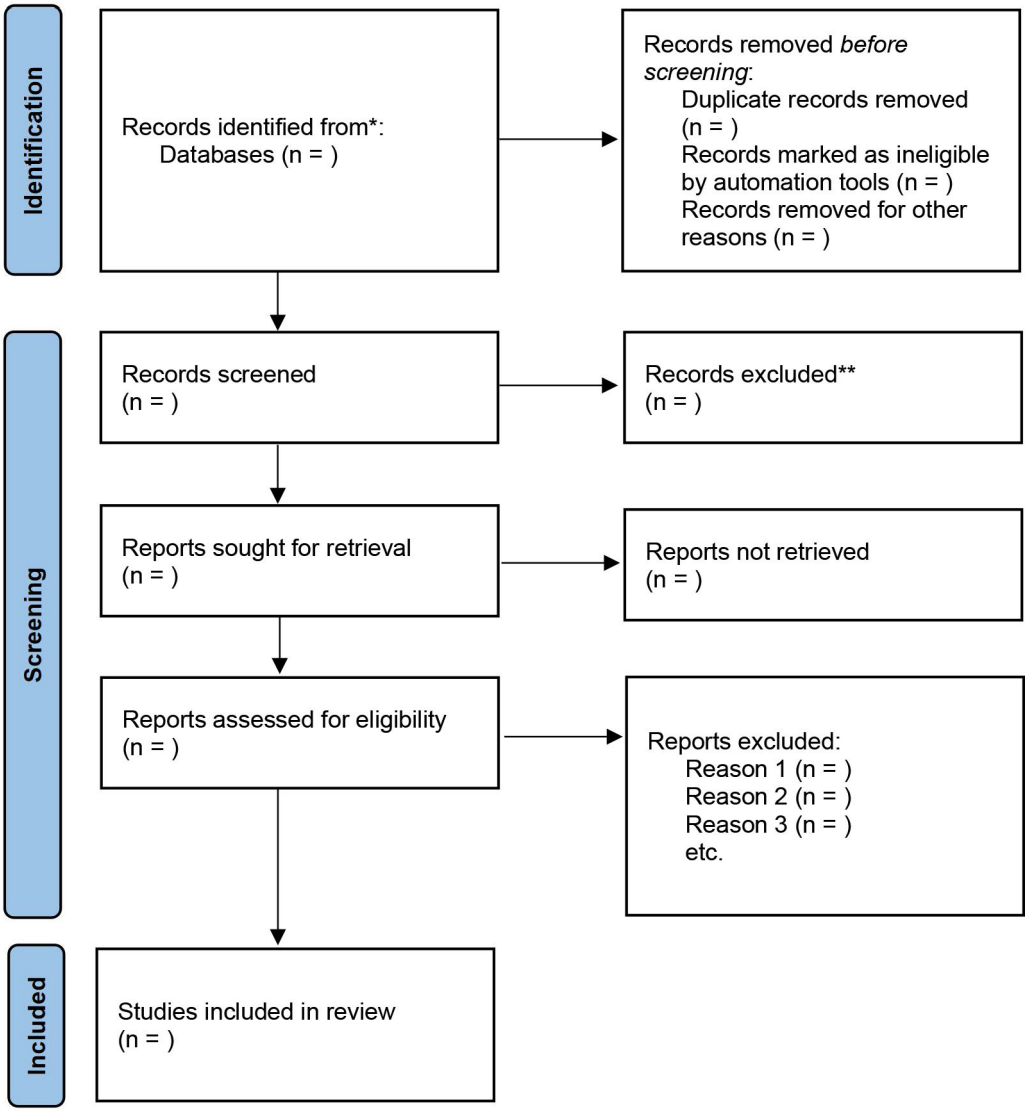

Figure 1 PRISMA flow diagram. Source: Adapted from Page.[88] PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analysis.

to critically assess the methodological quality of each included study.[89] The checklist consists of 10 questions, including study methodology, data collection and analysis and outcome validity. All questions can be scored as 'yes', 'no', or 'unclear', and in some cases as 'not applicable'.[72] A cut-off point of six 'yes' answers out of 10 questions will be predetermined: studies with more than six 'yes' answers will be considered to be of high quality.[73] Upon completion of the assessment, both parties will compare the results and identify the higher quality literature for inclusion. If the two reviewers disagree and agreement cannot be reached through discussion, a third reviewer's (JN) opinion will be sought.

Data extraction

Two independent reviewers (HZ and XL) will extract qualitative data from the papers finalised for inclusion using JBI System for the Unified Management Assessment and Review of Information (JBI SUMARI's) standardised data extraction tool, and a third reviewer (JN) will check the completeness and accuracy of the data extraction.[72] Extracted data will include: (1) authors, study country and specific setting (ie, care facility or community, etc), year of publication and purpose of study; (2) sample size, sample characteristics, study methods and data collection and type of intervention, (3) study findings related to facilitators and barriers and study limitations. If data included in the study are unclear or missing, we will contact the primary study authors to obtain key information. Two reviewers (HZ and XL) will extract the study results and their descriptions into an MS Excel spreadsheet and assign a level of credibility.[90]

Data synthesis

The findings of all qualitative studies will be pooled using the JBI SUMARI with the meta-aggregation approach.[72] The JBI SUMARI is a supplementary software developed by JBI Centre to conduct systematic reviews.[91] Among the methods of qualitative synthesis, meta-aggregation is most consistent with accepted practices for conducting

high-quality systematic reviews.[92] We will read the findings repeatedly to understand, analyse and interpret their meaning in the context of understanding the philosophical ideas and methodologies of each qualitative study, grouping similar findings together to form new categories, and then grouping the categories into integration results to form new ideas or interpretations.[72] The integration results will be interpreted using verbal text, graphics or tables to describe particular or potentially contradictory events or phenomena and to make recommendations about practice and research. If the literatures that meet the inclusion criteria provide enough information, we will compare and discuss the differences in barriers and facilitators between interventions based on different contexts, different types of interventions (eg, interventions for groups and interventions for individuals) or different terms (short-term adoption and long-term adoption).

We will use the Consolidated Framework for Implementation Research (CFIR) to synthesise the data. CFIR is a 'meta-theoretical framework' in the field of implementation science that integrates 19 different implementation theories or models to enable a comprehensive investigation of the multilevel barriers and facilitators affecting implementation.[93] CFIR contains 39 components in five main dimensions: intervention characteristics, outer setting, inner setting, characteristics of the individuals involved and the process of implementation, which interacts to influence the implementation and effectiveness of the intervention programme.[93] Furthermore, CFIR serves as an organisational framework that allows for the integration of factors that influence implementation in multiple settings.[93 94]

Assessing the certainty of findings

Two reviewers (HZ and XL) will independently assess the confidence in the findings of this review using the Confidence in the Evidence from Reviews of Qualitative research (GRADE-CERQual) approach.[95] This will increase the confidence level of each key finding. Two reviewers will be blind to each other's assessments; only after both reviewers have completed their initial assessment of an article, they will compare their assessments. If a consensus is lacking, a discussion will take place between the reviewers. If an agreement cannot be reached, the help of a third reviewer will be sought.[96] Results will be presented in the GRADE-CERQual summary of the qualitative results table.[97]

Patient and public involvement

As with other published study protocols, there has been no patient or public participation in the protocol phase of our study.[98 99]

Ethics and dissemination

This review does not require ethical approval because it is a systematic review of previously published studies. The results of this review will be disseminated through peer-reviewed publications and conference presentations.

Contributors HZ and MV are joint first authors. HZ, MV and HF conceived and designed the study. HZ, MV and XL wrote the manuscript. HZ and XL collaborated in developing the search strategy. JN, XZ, SW, YD and HF contributed to commented on the manuscript. HZ and HF are the study guarantors. HF oversaw this project and received a research grant to pay for the publication of the open-access article.

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Competing interests None declared.

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