







STUDY PROTOCOL

REVISED

Older adults and family caregivers' experience of digital health technology in frailty care: A systematic review and meta-ethnography protocol [version 2; peer review: 2 approved]

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Abstract





Background: Digital health technology has been identified as a valuable tool to support older adults with frailty needs in their home setting. Despite the numerous technologies and evaluations of these innovations, a synthesis of the older person and family caregivers' experience using technology for support self-management has not been conducted to date.


Methods and analysis: A systematic review and meta-ethnography will be conducted in accordance with the PRISMA and eMERGe reporting guidelines. Four peer-reviewed empirical evidence databases will be searched (Medline (Ovid), CINAHL, EMBASE, PsycINFO) using a defined search strategy. Studies containing qualitative data on the experiences of older people or family caregivers of using digital health technology to support frailty care will be included. Covidence software will be used to screen studies and extract data. The Critical Appraisal Skills Programme (CASP) checklist for qualitative research will be used by two independent reviewers to appraise all included papers. A meta-ethnography will be undertaken in accordance with the seven-phase method described by Noblit and Hare: (1) Getting started, (2) Deciding what is relevant to the initial interest, (3) Reading the studies, (4) Determining how the studies are related, (5) Translating the studies into one another, (6) Synthesizing translations and (7) Expressing the synthesis.


Discussion: To the best of our knowledge, this will be the first systematic review to integrate and synthesize the findings of qualitative studies of older citizens' experience of digital health

Open Peer Review

Approval Status  

	1	2
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version 1 13 May 2022	 view	 view

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technology. The findings of this meta-ethnography will endeavour to inform future research, policy and clinical practice. In particular, the results will help to inform the design of future digital health technology to meet the needs of older adults.

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Keywords

digital health, eHealth, ageing, frailty, meta-ethnography



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REVISED Amendments from Version 1

This version encompasses background and methodological clarifications based on the reviewers' feedback. The authors include a clarification regarding the prevalence of frailty and pre-frailty based on available evidence in the Introduction. The authors have included a further rationale for using meta-ethnography to investigate experiences of digital health amongst older people and family caregivers. Also, the authors have included revised search terms (as seen in Table 1) and search strategy (including search limits and inclusion criteria, as seen in Phase 2) to empirical evidence they aim to identify in the review.

Any further responses from the reviewers can be found at the end of the article

Introduction

Healthy and active ageing have become a global health priority as life expectancy is increasingly improving¹. It is estimated that by 2050, the median age of several European Union (EU) countries will have risen by up to eight years². However, this increase in an individual's lifespan does not infer better quality of life. With longer lifespans, people are at a higher risk of experiencing a chronic health condition which, in turn, places greater demands on the management of health and social care services³. Coupled with the increasing lifespans of our population are the decreasing fertility rates, which in turn have led to rising old-age dependency ratios across the EU. It is estimated that by 2050, the average of this ratio will be 50%, meaning that there will be less than two people of working age for every person over the age of 65², creating an unsustainable social security system that will not be sufficient to support the care of older people.

European government expenditures are increasingly burdened to cover the costs of chronic health conditions such as frailty, heart disease, cancer, diabetes, stroke, and arthritis⁴. It has been reported that these conditions account for 70–80% of public health expenditure in the EU, which amounts to an estimated €700 billion⁵. In the EU in 2018, approximately 37% of adults over the age of 65 were reported to have two or more chronic conditions⁶. The presence of chronic health conditions may limit one's capacity to carry out the activities of daily living (ADL), such as personal hygiene or grooming, dressing, toileting, transferring or ambulating, and eating, or instrumental activities of daily living (IADL), such as transportation and shopping, managing finances, shopping and meal preparation, house-cleaning and home maintenance, managing communication with others, medication management⁷. The inability to perform ADLs and IADLs implies further pressure on government expenditure, as long-term care assistance may be required⁸. In addition to government spending, out-of-pocket payments for individuals with chronic health conditions are higher due to increased health-care use, lower earnings due to disability, early retirement, and dependence on social security systems^{9–11}.

The burden of care on family or informal caregivers is an additional factor to consider in relation to chronic conditions,

the predominant profile being female and between the ages of 45 and 64 years¹², and accounts for 75% of the care provided to older dependent people¹³. Informal caregiving may create physical and psychological strain over extended periods of time and has the capacity to create secondary stress across multiple life domains such as work and family relationships¹⁴; these caregivers have also been referred to as 'invisible second patients' when caring for older adults¹⁵.

A common health condition amongst older people, often experienced with other chronic comorbidities, is frailty. Frailty is a distinct health condition related to the ageing process whereby multiple physiological systems gradually lose their intrinsic capacity which can result in sudden health status changes due to stress or an event such as a fall or an infection¹⁶. A recent estimation suggested that the prevalence of frailty ranged between 4 and 59% in populations of home-dwelling older people and is higher in women than in men¹⁷. However, an earlier systematic review¹⁸ found that the overall weighted average prevalence of frailty was 10.7%. Additionally, the review reported that the overall weighted average prevalence of pre-frailty was 41.6%, which underlines a critical need to provide proactive and preventative supports for older people to reduce the risk of developing the condition.

People living with frailty are known to have more falls, more disabilities, use more medications and require more access to long-term healthcare services than individuals without the condition¹⁹. Frailty is not inevitable and can be avoided, delayed, and reversed with timely and appropriate interventions such as self-management and care planning²⁰. It has been estimated that intervening against frailty would reduce the rates of dependency in older people by up to 40–50%. This reduction in dependency would imply an improvement in the quality of life of millions of European citizens and would significantly decrease European public spending²¹. Therefore, older adults must be encouraged to engage in proactive health behaviours that prevent or support individuals in maintaining their intrinsic capacity as they age.

Digital health has been identified as a valuable method in supporting older adults' self-management and well-being in their home setting^{22,23}. As a concept, no singular definition of digital health exists. In their recently published Global Strategy for Digital Health 2020–2025, The World Health Organisation (WHO)²⁴ referred to it as "the field of knowledge and practice associated with the development and use of digital technologies to improve health", which will be utilised in the current protocol. Christophorou and colleagues²⁵ identified several contexts in which digital health can promote active and healthy aging such as prolonging time in the working environment, overcoming social isolation and loneliness, accessing public and private services, and stimulating independence. Digital health technology enables healthcare providers to engage, motivate and promote healthy lifestyle behaviours amongst older adults, and includes but is not limited to, smartphone/tablet applications, websites, connected devices, video consultations and wearable tracking devices²⁶. A substantial light was shone on digital technology and its value in supporting older people

during the coronavirus disease 2019 (COVID-19) pandemic, when many older adults were required to stay in their homes, restricting their social contacts and preventing them from visiting their usual care centres, due to being considered a high-risk population²⁷.

While available empirical reviews detail several types of digital health interventions for older people with various conditions^{28–35}, there is a lack of uniformity between the condition included, intervention type and methods for evaluation in terms of their usability, acceptability and efficacy³⁶. More specifically, digital health interventions focusing on frailty care amongst older adults are scarce and rarely assess their effectiveness. This is compounded by the lack of agreement regarding the condition of what ‘frailty’ refers to. Many of the studies to date have failed to scientifically evaluate the benefits of digital health interventions in terms of frailty reversal and quality of life³⁶. Indeed, authors of a systematic review on technology for ageing in place reported a lack of outcome measurements in the studies included in their analysis³⁷. One scoping review on digital health interventions among people living with frailty reported validated assessment outcomes in only 45% of the studies included³⁶. In a systematic review performed by Kampmeijer *et al.*²⁶, the authors outlined the evidence on the facilitating factors and barriers to the use of digital health tools for health promotion and primary prevention among older adults. However, evidence on the effectiveness of the tools was not discussed in the review.

While it is evident that there has been increasing interest in the development and assessment of technologies for older people with frailty, to the best of the authors’ knowledge, there are currently no evidence synthesis regarding which digital health interventions better support older citizens living with frailty in their home setting. Therefore, it is difficult to determine if digital health can effectively promote independent living and/or ageing in place for older people with frailty, and if so, which types of digital health interventions are more effective. Moreover, there has been no effort to synthesise family caregivers’ experience of digital health interventions for frailty, whether they directly used the technology or supported a relative who did.

In a recent scoping review by Linn and colleagues³⁶ the main objective was to provide a broad overview of digital health interventions used for people living with frailty, to identify gaps in the literature, and to describe the robustness of the digital approaches. The authors of this review highlighted the heterogeneity among frailty assessments, study designs and evaluations of digital health interventions within the included studies, making it difficult to draw conclusions on their effectiveness. Furthermore, it was found that few studies evaluated efficacy, usability or feasibility and that frailty assessment of their sample was commonly not reported in over a third of the included studies³⁶. In addition, for the studies that did assess and report their sample’s frailty levels, lack of uniformity existed regarding the frailty assessment employed and frailty scores of participants. It should also be considered that assessment of the caregivers’ experience with the digital health intervention was not discussed, highlighting another area that requires further investigation. Linn and colleagues³⁶

concluded their review with a call for “*standardized approaches to assess frailty, well-structured randomized controlled trials, and proper evaluation and report*”.

Taking the conclusions of Linn and colleagues’³⁶ review into consideration, it is evident that there is a need for a standardized approach to investigating the area of digital health interventions in frailty care. Acknowledging that reviews in the area suggest that the effectiveness of such interventions remains encouraging yet ambiguous, it is important to broaden the scope of the evaluation by examining the experiences of older people and family caregivers using technology, rather than simply measuring their effectiveness rates or health outcome changes. While usability and efficacy are central to evaluation of digital health to ensure they achieve their intended purpose, it may also prove insightful to understand how older people and their family caregivers responded to using such technology and what it personally meant for them in their daily lives. In order to effectively contribute to the current body of knowledge, the authors of the original review were consulted in the development of the current protocol. It was determined that an in-depth qualitative synthesis was necessary regarding the evidence to date, which is the approach set forth in the current protocol.

Research aims

The aims of the current protocol are (a) to systematically search empirical qualitative literature to identify studies exploring the experiences of older adults and family caregivers using digital health to support the management of frailty in the home setting, and (b) to perform a meta-ethnography to synthesise the included studies with the intention of describing the phenomenon and identifying new insights. The following research questions were established, based on the SPIDER tool³⁸, which will guide the review and the qualitative synthesis of identified literature:

1. What are older adults and their family caregivers’ experiences of digital health technology to support frailty care in the home setting?
2. What facilitators and barriers exist to using digital health technology for frailty care in the home setting amongst older adults and their family caregivers?

Protocol

The systematic review protocol is written in accordance with The Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) statement which is publicly available³⁹. Qualitative studies identified in the review will be subject to a meta-ethnographic study, which is an inductive, highly interpretive approach⁴⁰. A meta-ethnographic approach has been chosen as the method of qualitative evidence synthesis for this review because it “provides the opportunity for us to carefully consider the relationship between studies, understand the issues and to comprehend the reality of everyday life”⁴⁰. Meta-ethnography was chosen for its ability to explore existing qualitative data and formulate comprehensive interpretations or theoretical frameworks using existing evidence. Meta-ethnography has been previously used in health-care settings to examine care transitions of older people and

their caregivers⁴¹, physical activity in older age⁴². More specifically, meta-ethnography has previously employed to understand the experiences of older adults’ using digital health to engage in physical activity⁴³ and while receiving care for chronic obstructive pulmonary disease⁴⁴. While previous qualitative evidence exists with regarding older adults’ experience of using digital health, no study exists specific to frailty care. Additionally, no study exists regarding family caregivers’ experience of digital health in the context of providing care to an older adult.

Meta-ethnography will be used to synthesize and evaluate the results of the included studies in accordance with Noblit and Hare’s⁴⁰ seven stages: (1) Getting started, (2) Deciding what is relevant to the initial interest, (3) Reading the studies, (4) Determining how the studies are related, (5) Translating the studies into one another, (6) Synthesizing translations and (7) Expressing the synthesis. These steps will be explained in further detail below in how they relate to the current protocol. The review will be reported in line with the eMERGe guidance for reporting meta-ethnography⁴⁵. Ethical approval is not required for the synthesis of published peer-reviewed studies and their related data.

Phase 1: Selecting meta-ethnography and getting started

Phase one of a meta-ethnography involves reporting the rationale and the context for the study. To the best of our knowledge, no meta-ethnography exists to date which synthesises the evidence on the experiences of older adults with frailty using digital health technology in their home setting. Following the authors’ discovery of the comprehensive scoping review by Linn and colleagues³⁶, a gap in the knowledge existed regarding a deeper and focused examination of qualitative evidence on this topic. A key aim of the review and rationale for utilising meta-ethnography is to provide a conceptual understanding of how older adults and their family caregivers experience and engage with digital health technology within the context of frailty care.

Phase 2: Deciding what is relevant to research aim

Search strategy. The Sample, Phenomenon of Interest, Design, Evaluation, and Research type (SPIDER) tool³⁸ was used to structure the search terms. A search strategy (Table 1) was developed based on the research questions, with key terms from this strategy tested in a scoping search of the literature. Relevant keywords and phrases will be used in each database. Keywords and phrases include older adults, family caregivers, digital health technology and experiences. The search strategy was reviewed by a university research librarian for comprehensiveness. The search strategy will be adapted and conducted within four empirical databases: Medline (Ovid), CINAHL, EMBASE and PsycINFO. Each database will be searched using the strategy with each string being limited to Title and Abstract fields. Search results will be limited to articles written in English dated from 2010 to the present day. Reference lists of relevant articles will also be manually searched by the author team to identify further studies.

Study selection. The SPIDER search strategy tool³⁸ also informed the eligibility criteria to identify the relevant literature. Table 2 outlines each aspect of the SPIDER tool (sample, phenomenon of interest, design, evaluation, and Research Type) and its related inclusion/exclusion criteria. Included studies will describe a sample of older adults (65+) with a diagnosis of mild or moderate frailty and their family or informal caregivers. All studies identified through the empirical database and reference list searches must be peer-reviewed to be included. Given the lack of definition internationally regarding the medical condition of frailty, where adults do not have a formal diagnosis but identify as having frailty needs will still be included in the screening process.

When the search has been conducted in each database, the identified articles will be imported into the bibliographic reference manager, Mendeley, to remove any duplicates before initial screening by reviewers. The citations will then be exported to the screening and data extraction software tool Covidence, to screen all articles using the eligibility criteria. Each article will

Table 1. Search terms for systematic review.

	Search terms
Sample	("older people*" OR "older person*" OR "older adult*" OR "older citizen*" OR "senior*" OR elder* OR "ageing population*" OR "ageing adult*" OR "old age*" OR "older age" OR "geriatric*" OR "older individual*" OR elder* OR "aged") OR (Family care* OR caregiver* OR family OR informal care* OR carer* OR spouse* OR partner OR friend* OR relative* OR guardian* OR dyad*) AND frail* OR "challenges in the activities of daily living" OR ADLs OR pre-frail
Phenomenon of interest	"digital health*" OR "digital intervention*" eHealth OR e-Health OR telemedicine OR "tele-medicine" OR telecare OR tele-care OR "electronic health" OR "internet health" OR telehealth OR tele-health OR "mobile health" OR "mHealth" OR m-Health OR "mobile app*" OR "tablet app*" OR "Medicine 2.0" OR teleconsultation*
Design	Interview* OR "focus group*" OR "co-design" OR "participatory research*"
Evaluation	experience OR patient-perspective* OR accept* OR feasibility OR usability OR expectation OR understanding OR comprehension OR perception* OR attitude*
Research type	qualitative OR "mixed method*"

Table 2. Sample, Phenomenon of Interest, Design, Evaluation, and Research type tool (SPIDER) table of study inclusion and exclusion criteria.

	Inclusion	Exclusion
Sample	<ul style="list-style-type: none"> Older citizens, aged $\geq 65+$ living with frailty in their home setting Family caregivers to older citizens ($\geq 65+$) living with frailty in the home setting 	<ul style="list-style-type: none"> Individuals under the age of 65 with frailty Older people with significant cognitive impairment People with multiple conditions where frailty is not the primary focus People living in institutional settings (e.g., hospital or nursing home, age-friendly supported housing)
Phenomenon of interest	<ul style="list-style-type: none"> Experience of digital health in their home setting 	<ul style="list-style-type: none"> Experience of digital health in care setting Experience of digital health where frailty is not the main condition Studies on perception or attitudes with no direct experience reported Digital health design studies regarding how they could be supported
Design	<ul style="list-style-type: none"> Qualitative or mixed-method studies reporting primary qualitative data collected using qualitative methods (through direct observation; focus groups or interviews) 	<ul style="list-style-type: none"> Studies that report quantitative data only including questionnaire studies with open-ended free text questions
Evaluation	<ul style="list-style-type: none"> Qualitative analysis of lived experience of using digital health technology including feasibility, acceptability, facilitators, barriers 	<ul style="list-style-type: none"> Studies that evaluate using quantitative methods only Studies that do not explicitly state the method of analysis
Research type	<ul style="list-style-type: none"> Peer-reviewed journal articles using qualitative design or including a qualitative component that are distinguished from other methods used Full text available in English language 	<ul style="list-style-type: none"> Reviews; protocols; theoretical work; editorials; opinion pieces and grey literature Non-English language

be required to be approved by two independent reviewers (AD, RD) before either being included or excluded in the review. A pilot testing of articles (n=10) using the Covidence software package and inclusion and exclusion criteria will be undertaken by the authors to ensure consistency of the methodology adopted in the selection process⁴⁶. Full-text screening will then be carried out on all articles that meet the inclusion criteria during the initial screening round by two independent reviewers (AD, RD). In the instance of disagreement regarding an article's inclusion, a third reviewer (AC) will additionally independently assess the relevance of the article and decide the final outcome. A PRISMA flow diagram will be created once all screening has been completed to ensure transparency of the process.

Quality appraisal. Despite the lack of consensus regarding quality appraisal for qualitative research, the authors will include this step in the evidence identification for the purpose of critically evaluating the evidence and the rigor and transparency. The methodological quality of the included studies will be appraised using the ten-item Critical Appraisal Skills Programme (CASP) checklist for qualitative research. The CASP tool is widely used in qualitative research and has been recommended for use in health research. Two evaluators (AD,

RD) will independently assess the quality of each study with disagreement resolved through consensus and discussion with a third evaluator (ER), if necessary. No studies will be excluded based on quality; however, the appraisal will be used to highlight methodological limitations in their interpretation of the study findings, particularly when developing their own synthesis.

Phase 3: Reading the studies

This stage of the meta-ethnography will involve repeated careful reading and immersion in the identified studies to obtain familiarity, and to determine the key concepts and author interpretations relevant to the study aims. Following repeated close reading of the identified articles, the raw data for the meta-ethnographic synthesis will be extracted into a collaborative data extraction form in a Microsoft Word document between the study authors. First-order constructs (*i.e.*, participant quotations) and second-order constructs (*i.e.*, author metaphorical themes or concepts) will be extracted from each article at this point⁴⁷. A separate data extraction form will also be created⁴⁸ to describe study contextual information, such as study setting, participants, research design and aim, frailty measured and description of the digital health technology. Throughout this phase, two reviewers will initially

complete coding and data extraction independently, before working together to discuss discrepancies in their analysis and identify emerging themes.

Phase 4: Determining how the studies are related

This phase will involve determining the relationships between the key concepts from the range of papers. In this context, a ‘concept’ refers to a “meaningful idea that develops by comparing particular instances” where they must explain and not just describe the data⁴⁵. In order to understand the relationship between concepts amongst the various studies, the authors will create a list of themes to conduct a close comparison and assess the common and recurring concepts between studies. From this list, the themes from the studies will be clustered into relevant categories, in which common concepts will be grouped according to similar underlying metaphors⁴⁸. These categories will be labelled using terms that encompass the key concepts they contain. This phase will be iterative whereby revisions may be conducted based on author discussions and the source text.

Phase 5: Translating the studies into one another

This phase involves a constant comparison of the studies to examine the key concepts within. The translations will be conducted in chronological order⁴⁹. Each concept from each paper will be compared with all other articles in turn to reciprocally assess the presence or absence of the concept, with the aim of organising the concepts in further conceptual categories⁵⁰. Team discussions regarding the key concepts and their meanings will be held to ensure rigor and challenge interpretations of the data. The two lead authors (AD, RD) will maintain two independent journals during this phase to ensure the transparency of analysis, and that they are aware of their own theoretical position⁵¹.

Phase 6: Synthesizing the translations

During this phase, third-order constructs (*i.e.*, the reviewer’s higher-order interpretations of first- and second-order constructs) will be established with the intention of “making the whole into something more than the parts alone imply”⁵². The authors will view the studies as a whole, rather than individual studies, to garner a conceptual framework^{47,50} which will explain the phenomenon of interest. This phase will be conducted in two steps. In the first step, a reciprocal and refutational synthesis will be performed, in which the authors will determine the similarities and dissimilarities between the studies. This step will help inform whether the synthesis will focus their cohesion (reciprocal translation synthesis), contradictions (refutational synthesis) or whether both are necessary⁴⁸. A line of argument synthesis will then be created from third-order constructs by the lead authors independently (AD, RD) through constant comparison to create higher-order interpretations using the identified internal concepts within the identified studies. Once this step is carried out independently, the two lead authors will merge their findings to produce the final line of argument synthesis and will be reviewed by the wider team.

Phase 7: Expressing the synthesis

The authors will follow the eMERGE reporting guidelines⁴⁵ when writing up the synthesis for dissemination. Meta-ethnographic reporting will focus on the (i) summary of findings (ii) strengths,

limitations and reflexivity and (iii) recommendations and conclusions⁴⁵. Findings from the meta-ethnography will be published in a peer-reviewed journal, presented at relevant international conferences and made available to the general public and patients, in a suitable format. When creating material for the general public, including older people, we will work with an older person advocacy organisation to ensure that the media are acceptable and accessible to the population and disseminated using the most effective and engaging channels.

Conclusions

A cornerstone in the management and treatment of frailty is health behavioural change and lifestyle in the home setting, such as diet and exercise, to maintain one’s intrinsic capacity. As such, digital health technology has been valued for its potential to promote independent and autonomous living in older people. To the best of our knowledge, this will be the first systematic review to integrate and synthesize the findings of qualitative studies of older adults with frailty and their experience of digital health. This systematic review and meta-ethnography protocol describes the method in which to address vital gap in the existing literature on lived experiences of older adults using digital health technology. We believe that a focus on how older adults have experienced self-management technology in their home setting is essential to understanding how to expand and make progression in the field. While more research is being invested in deciding how to collaborate and support this population, it is important to take stock of the evidence to date in what is known about their lived experience to help shape what it is to come. Without this understanding, researchers and technology inventors may be destined to repeat previous approaches that were not acceptable or effective amongst this population. While the results of the review may not be generalisable to all older adults, we believe it is important to focus on the specific health condition of frailty to understand the nuances and needs of those who experience it. The findings of this review are intended to inform future research and policy, digital technology design and clinical practice.

Data availability

Underlying data

No data are associated with this article.

Reporting guidelines

Figshare: PRISMA-P Checklist for “Older adults and family caregivers’ experience of digital health technology in frailty care: A systematic review and meta-ethnography protocol”, <https://doi.org/10.6084/m9.figshare.19657053.v1>³⁹

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/) (CC-BY 4.0).

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Áine Teahan 

Trinity College Dublin, Dublin, Ireland

Many thanks to the author for addressing and replying to my comments. This is an important area of research particularly in the context of ageing, family carers and digital health. I have no further comments and look forward to reading future findings.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am currently working on a research project exploring digital health for older people with multi-morbidity. My previous research has focused on psychosocial support for family carers of people with dementia. I am broadly familiar with the field of frailty. I have also conducted systematic reviews in the past.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 06 June 2022

<https://doi.org/10.21956/hrbopenres.14791.r32114>

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Gloria A. Aguayo 

Department of Precision Health, Luxembourg Institute of Health, Strassen, Luxembourg

This document is a protocol of a systematic review and meta-ethnography about the experiences of older adults with digital health technology. The protocol is well-written. The research question is relevant for the older population with frailty but not only for this population. The introduction gives a comprehensive background for the study citing the most important literature in the field. It has an adequate methodology with details describing a standardised stud selection using the SPIDER search strategy tool and the seven steps for meta-ethnography and its standardised guideline (eMERGe).

Is the rationale for, and objectives of, the study clearly described?

Yes

Is the study design appropriate for the research question?

Yes

Are sufficient details of the methods provided to allow replication by others?

Yes

Are the datasets clearly presented in a useable and accessible format?

Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Healthy ageing, frailty, diabetes.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 01 June 2022

<https://doi.org/10.21956/hrbopenres.14791.r32112>

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Áine Teahan 

Trinity College Dublin, Dublin, Ireland

Thank you for the opportunity to review this paper. This is a well-written protocol for a systematic review and meta-ethnography for older people with frailty and family carers. I look forward to reading future findings.

I have made some suggestions and raised some points for clarification below.

Introduction:

The figure 4-59% prevalence of frailty in older people is quite a big range. It would be helpful if the authors could reference the weighted prevalence of 10.7% reported as well (Collard *et al.*, 2012).¹ Also the weighted prevalence of pre-frailty (41.6%) would provide additional background on the importance of research in this area.

If available, it would be useful if the authors could reference some examples of meta-ethnographic approaches applied to digital health and older people with other health conditions. This would provide some concrete examples of the benefits of this methodology in digital health.

Research Aims:

I am unclear on the first aim- does this systematic review aim to explore the experiences of older adults and family carers (i.e. care dyads)? Or does the SR aim to explore the experiences of older adults and/or family carers?

If the latter, the sample search terms in Table 1 will need slight modification. As they're currently designed this search strategy require that both older people with frailty and family carer key words need to be present. This could miss literature focusing on older people but not family carers and vice versa.

Methods:

Depending on the authors' response to my research aims query- Table 1 may require an edit.

For replicability, it would be useful if the authors' would specify within what limits each string will search i.e. title, abstract, full-text etc- Table 1.

The authors identified four peer-reviewed databases- is peer review an inclusion/exclusion criteria for the review? Will the hand-searched citations need to be peer reviewed too?

References

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Is the rationale for, and objectives of, the study clearly described?

Partly

Is the study design appropriate for the research question?

Yes

Are sufficient details of the methods provided to allow replication by others?

Yes

Are the datasets clearly presented in a useable and accessible format?

Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am currently working on a research project exploring digital health for older people with multi-morbidity. My previous research has focused on psychosocial support for family carers of people with dementia. I am broadly familiar with the field of frailty. I have also conducted systematic reviews in the past.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 12 Aug 2022

Andrew Darley, University College Dublin, Dublin, Ireland

Dear Reviewers,

We are grateful for the time and effort committed by you in evaluating our manuscript. Based on your feedback, we have amended the paper and provided responses to each comment below. We believe we have appropriately addressed your suggestions and the protocol is stronger as a result.

Best Wishes,
The Author Team

Reviewer Comment

Introduction: The figure 4-59% prevalence of frailty in older people is quite a big range. It would be helpful if the authors could reference the weighted prevalence of 10.7% reported as well (Collard *et al.*, 2012).¹ Also the weighted prevalence of pre-frailty (41.6%) would provide additional background on the importance of research in this area.

Author Response

Thank you for this suggestion and statistics. We have reworded this statement to include the weighted prevalence for frailty and pre-frailty.

If available, it would be useful if the authors could reference some examples of meta-ethnographic approaches applied to digital health and older people with other health conditions. This would provide some concrete examples of the benefits of this methodology in digital health.

Author Response

We have identified two studies that adopted meta-ethnography to study older adults' experience of digital health. We were unable to identify studies specific to frailty care. This has been included under 'Protocol' where the method is explained and refers to other

healthcare settings in which it has been applied.

Research Aims:

I am unclear on the first aim- does this systematic review aim to explore the experiences of older adults and family carers (i.e. care dyads)? Or does the SR aim to explore the experiences of older adults and/or family carers?

If the latter, the sample search terms in Table 1 will need slight modification. As they're currently designed this search strategy require that both older people with frailty and family carer key words need to be present. This could miss literature focusing on older people but not family carers and vice versa.

Author Response

The review will focus on exploring experiences of older adults and/or family carers. We have amended the search strategy to clarify and reflect the target sample

Methods: Depending on the authors' response to my research aims query- Table 1 may require an edit.

Author Response

This has been edited based on previous comment.

For replicability, it would be useful if the authors' would specify within what limits each string will search i.e. title, abstract, full-text etc- Table 1.

Author Response

The search strategy in each database will be limited to Title and Abstract. We have included a statement this specification under 'Search Strategy'.

The authors identified four peer-reviewed databases- is peer review an inclusion/exclusion criteria for the review? Will the hand-searched citations need to be peer reviewed too?

Author Response

The review will focus on evidence that has been peer reviewed and is a criteria to be included. We will be searching CINAHL which contains both peer-review and grey literature so would only include the peer-reviewed material. We have included a sentence under 'Search Strategy' to explicitly state this.

Competing Interests: No competing interests were disclosed.