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Protocol for a scoping review of patient–clinician digital health interventions for the population with hip fracture

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ABSTRACT

Introduction Patient–clinician digital health interventions can potentially improve the care of patients with hip fracture transitioning from hospital to rehabilitation to home. Assisting older patients with a hip fracture and their caregivers in managing their postsurgery care is crucial for ensuring the best rehabilitation outcomes. With the increased availability and wide uptake of mobile devices, the use of digital health to better assist patients in their care has become more common. Among the older adult population, hip fractures are a common occurrence and integrated postsurgery care is key for optimal recovery. The overall aims are to examine the available literature on the impact of hip fracture-specific patient–clinician digital health interventions on patient outcomes and healthcare delivery processes; to identify the barriers and enablers to the uptake and implementation of these digital health interventions; and to provide strategies for improved use of digital health technologies.

Methods and analysis We will conduct a scoping review using Arksey and O'Malley's methodology framework and following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement for the Scoping Reviews reporting format. A search strategy will be developed, and key databases will be searched until approximately May 2022. A two-step screening process and data extraction of included studies will be performed by two reviewers. Any disagreement will be resolved by consensus or by a third reviewer. For the included studies, a narrative data synthesis will be conducted. Barriers and enablers identified will be mapped to the domains of the Theoretical Domains Framework and related strategies will be provided to guide the uptake of future patient–clinician digital health interventions.

Ethics and dissemination This review does not require ethics approval. The results will be presented at a scientific conference and published in a peer-reviewed journal. We will also involve relevant stakeholders to determine appropriate approaches for dissemination.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ We will use an established scoping review methodology framework to summarise the existing evidence on patient–clinician digital health interventions for the population with hip fracture.

⇒ We anticipate a large volume of peer-reviewed scientific articles; thus, the grey literature searching will be limited to clinical trial databases and key digital health technology websites.

⇒ Due to time constraints, we will only consult with a small number of key experts to identify additional references for potential studies to include and to collect feedback about the findings identified by the review.

INTRODUCTION

Patient–clinician digital health interventions can help guide patients and their informal caregivers understand their healthcare needs as they navigate our healthcare system.[1] According to the WHO,[2] patient–clinician digital health interventions are classified as 'targeted patient/client communication' technologies. This type of digital health intervention typically involves the use of communication and information technologies to support the exchange of information between clinicians and their patients regarding their care.[2] This includes patient education, discharge information, notifications and reminders for appointments or treatments, follow-up services, behaviour change communication, medication management and communication on patient-specific health status or clinical history across the continuum of care.[2] A recent meta-analysis showed that select digital health interventions (n=5) for patients with fragility fractures were two times more effective to prevent secondary fractures than usual care.[3] However, components of the digital health interventions often vary making comparison between these technologies difficult. A recent review of 39 studies examined the role of digital health interventions for older patients with hip fractures and found that these interventions focused mainly on digital tools to support physicians providing clinical care.[4] Nonetheless, a systematic review of 42 studies identified that

technology interventions can help improve healthcare delivery processes by engaging patients in managing their care and preventing hospital readmissions.[1]

With the increased availability and wide uptake of personal communication devices, digital health interventions to better engage patients in their care have become increasingly common.[5] Digital health interventions have shown to be an effective approach for patients with chronic illness and their clinicians. Specifically, they have been implemented to better engage patients in managing their own diabetes,[6 7] cardiovascular disease,[8] and chronic obstructive pulmonary disease.[9]

Similarly, hip fracture care can be complex. Patients with hip fracture often require extensive postsurgery care across multiple sectors. This care can include pain control and management, osteoporosis assessment and treatment, fall risk prevention interventions, physical rehabilitation, assistive walking devices and/or home modifications, as well as follow-up visits with their orthopaedic surgeon and their primary care provider. Enabling patients with hip fracture and their informal caregivers to participate in the coordination of their treatment along the complete continuum of care from diagnosis to discharge is crucial for optimal patient outcomes.

The lack of or inadequate information about discharge instructions to patients, specifically for older patients with a hip fracture, has been identified as an important care gap during care transitions.[10] Some avoidable readmissions may result from a lack of patient-centred and caregiver-centred solutions and other challenges faced during the transition from hospital to home.[11 12] Emerging research highlights how patient engagement contributes to improved care,[13] and for many organisations, improving patient engagement and developing patient-centred processes is a priority.[14] Other studies have highlighted the vulnerabilities of patients during the post-discharge period and the poor retention of verbal instructions.[15 16] The provision of high-quality teaching and written discharge instructions can be crucial in improving a patient's understanding of their care, facilitating the transition from hospital to home and may prevent avoidable readmissions.[17–21]

Engagement in the discharge planning process includes making sure patients and their informal caregivers know the important aspects of their specific health conditions, understand their medications, are able to self-manage common symptoms, have the ability to follow discharge instructions and are informed regarding what signs and symptoms indicate a need to seek appropriate medical care. Despite improvement efforts, there is a need for more efficient approaches to address the barriers patients and their informal caregivers' experience as they transfer through the healthcare system from hospital to geriatric rehabilitation to home. In particular, one aspect is *poor communication between clinicians and patients (including their informal caregivers) during transitions* has been noted as being an especially critical care gap.[22 23] Deficiencies in this area can leave patients and their informal caregivers lacking information regarding how to manage their care. Unlike paper-based forms or information packages, digital health can provide real-time guidance and support to patients and help them to better navigate our healthcare system.

Despite the growing number of patients and informal caregivers who have access to technology (eg, phone, tablet, laptop computer) and would like their discharge information to be more readily available to them,[24] little is known about what patient–clinician digital health interventions are available for the population with hip fracture. The primary aim is to examine the available literature on the impact of hip fracture-specific patient–clinician digital health interventions on patient outcomes and healthcare delivery processes. The secondary aim is to identify the barriers and enablers to the uptake and implementation of these digital health interventions. The third aim is to provide strategies to improve the use of these digital health technologies.

METHODS

Protocol design

We will conduct a scoping review using Arksey and O'Malley's methodological framework[25 26] and following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement for the Scoping Reviews (PRISMA-ScR) reporting format.[27] This protocol is registered in Open Science Framework (https://osf.io/w6a89).[28]

This review will consist of the following stages: (1) identification of the research question; (2) identification of relevant studies; (3) selection of eligible studies; (4) charting the data; (5) collating, summarising and reporting of the results; and (6) consultation with stakeholders.[25 26]

Stage 1: identification of the research questions

1. What is the impact of patient–clinician digital health interventions for older patients with a hip fracture on patient outcomes and healthcare delivery processes?
2. What are the barriers and enablers to the use of patient–clinician digital health interventions for older patients with a hip fracture transitioning from hospital to rehabilitation to home?
3. What strategies exist to improve the use of patient–clinician digital health interventions for patients with hip fracture transitioning from hospital to rehabilitation to home?

Stage 2: identification of relevant studies

The search strategy will be developed by a senior information specialist using an iterative process in consultation with the review team. The MEDLINE strategy will be peer-reviewed prior to execution by another information specialist according to the Peer Review of Electronic Search Strategies guidelines.[29] The strategy will use a combination of controlled vocabulary (eg, 'Hip Fractures', 'Telemedicine', 'Rehabilitation') and keywords

(eg, 'broken hip', 'digital health', 'post-surgical care'). There will be no dates or language limits on any of the searches but where possible, animal-only records will be removed from the results. Using the multifile option and deduplication tool available on the OVID platform, we will search Ovid MEDLINE ALL, Embase Classic+Embase, APA PsycINFO and EBM Reviews (Cochrane Database of Systematic Reviews, CENTRAL and DARE). We will also search CINAHL on Ebsco. The MEDLINE search strategy is shown in online supplemental appendix 1.

Results will be downloaded and deduplicated using EndNote 9.3.3 (Clarivate Analytics) and uploaded to Covidence,[30] a citation screening software, where any further duplicates will be identified and removed. We will perform a targeted grey literature search of clinical trial databases (ClinicalTrials.gov and ICTRP Search Portal) and key digital health technology websites. Finally, we will manually search the reference lists of all the included studies and relevant systematic reviews.

Stage 3: selection of the eligible studies

The inclusion and exclusion criteria will follow the Population, Concept, Context format. **Population:** hip fracture patients 50 years of age or older who had surgical repair; **Concept:** postsurgery care (eg, pain control and management, mobilisation, follow-up appointments) using any patient–clinician digital health interventions such as mobile technology, web-based applications, digital communication tools; **Context:** care across various healthcare settings.

A two-step screening process will be performed by two reviewers (CB and SH). Specifically, two reviewers will independently screen titles and abstracts (level 1 screening) according to the predetermined eligibility criteria. For level 2 screening, two reviewers will independently screen the full texts. Any disagreement will be resolved by consensus or by a third reviewer (Steve P). The reasons for exclusion will be noted using the PRISMA-ScR reporting format.[27]

Stage 4: charting the data

Prior to starting the data extraction, we will pilot test our data extraction form in Microsoft Excel. Two reviewers (CB and SH) will independently extract the data from the eligible studies. This will include full reference, country, purpose, study design, type of participants (eg, patients, caregivers, providers), number of participants, theoretical approach, description of the patient–clinician digital health intervention, data analysis and study results/outcomes (eg, patient outcomes, healthcare delivery processes, barriers/enablers). Any disagreement will be discussed and resolved by consensus.

Stage 5: collating, summarising and reporting the results

We will conduct a narrative data synthesis. Data will be grouped by intervention type, outcome and study design. All data tables will contain data on setting, intervention and control, study sample, patient characteristics, study design and outcomes. In addition, the Theoretical Domain Framework (TDF)[31 32] will guide the analysis of the barriers and enablers to the uptake of digital health interventions. The TDF is a framework that consists of 14 domains: (1) Knowledge, (2) Skills, (3) Social/Professional role and identity, (4) Beliefs about capabilities, (5) Optimism, (6) Beliefs about consequences, (7) Reinforcement, (8) Intentions, (9) Goals, (10) Memory, attention, and decision processes, (11) Environmental context and resources, (12) Social influences (13) Emotion and (14) Behavioural regulation.

Two reviewers will independently group the data extracted from the included studies into themes and code each theme as a barrier or an enabler. The themes will then be mapped to each of the TDF domains. If there are any themes that cannot be mapped to the TDF domains, we will report them separately. For each barrier and enabler, we will report the frequency and percentage to identify the top domains. Any disagreement will be discussed and resolved by consensus by the two reviewers (CB and SH) or by consulting a third reviewer (Steve P). Behavioural change techniques[33] that align with the barriers and enablers will be selected to guide the uptake of future patient–clinician digital health interventions for older patients with a hip fracture transitioning from hospital to rehabilitation to home.

Stage 6: consultation with stakeholders

Our research team is comprised of clinicians who will participate in the research process and will provide ongoing consultation. Following the recommendations by Levac *et al*,[26] we will also consult with a small number of digital health developers (n=2–3) within the research team's networks to help us identify any additional studies to include and to collect feedback about the findings identified by the review. In addition, we will also engage with stakeholders to determine possible approaches for dissemination and knowledge translation opportunities.

Patient and public involvement

No patients were involved.

ETHICS AND DISSEMINATION

This review does not require ethics approval. The results of this review will provide an overview of patient–clinician digital health interventions for patients with hip fracture as well as the barriers and enablers for their uptake and implementation. The results will provide information for various stakeholders such as researchers, clinicians, administrators, and policymakers. For dissemination activities, the review will be presented at a scientific conference and published in a peer-reviewed journal.

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Competing interests None declared.

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