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Sustainability of fall prevention exercise programmes for community-dwelling older adults: a scoping review protocol

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ABSTRACT

Introduction Falls have financial, emotional and physical implications for ageing individuals and the healthcare system. Evidence-based exercise programmes have been one of the most effective ways of preventing falls in community dwellings for older adults. However, more research is needed to understand how to sustain these programmes. This scoping review protocol describes our plan to investigate the factors influencing the sustainability of community-based fall prevention exercise programmes.

Methods and analysis Our scoping review will use the Joanna Briggs Institute methodology and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews framework. The studies will have no restrictions, including publication date, language or geographic location. Key search terms concerning programme sustainability and exercise falls prevention will be conducted in Medline, EMBASE, Cumulative Index to Nursing and Allied Health Literature, Academic Search Premier, APA PsycINFO and SPORTDiscus in consultation with an experienced librarian. Once duplicates have been removed, two independent reviewers will conduct title and abstract screening, full-text screening and data extraction. Data from eligible articles will be collated and charted to summarise data into three categories: (1) study description, including publication date, author(s), study location, paper's aim/purpose, study participants, study design and conclusion; (2) data regarding the type of exercise programme will be used using the 16-point checklist Consensus on Exercise Reporting Template; and (3) data regarding sustainability will be organised using domains from the Program Sustainability Assessment Tool. Our results will be charted through the use of Covidence to identify patterns across the studies. Additionally, narrative synthesis will be employed to articulate the study findings.

Ethics and dissemination As this is a scoping review, we do not require ethics approval. We intend to share our report findings with scientists, healthcare professionals and decision-makers. We will publish our results in reputable scientific journals and present them at relevant conferences.

STRENGTH AND LIMITATION OF THIS STUDY

⇒ Provides a scoping review of the available literature on the sustainability of exercise programmes for community-dwelling older adults.
⇒ Emphasises the breadth of available information rather than an indepth analysis of sustainability in exercise programmes for older adults.
⇒ An inherent limitation of this scoping review is the variability in replicating the search due to the constantly evolving body of literature and the differing interpretations and definitions of sustainability within the field, which may impact the results.
⇒ Grey literature was excluded from the review, meaning unpublished data will not be considered, which limits the scope of the findings.

INTRODUCTION

Falls are common in older adults and have costly consequences.[1] As individuals age, the rates of falls increase, with older adults aged 85 and over doubling their fall rates.[2 3] A fall can cause serious injuries such as fractures, head trauma and even death.[4 5] Furthermore, falls place a significant burden on the healthcare system by being linked to higher institutionalisation rates, increased hospital length of stay and long-term disabilities.[6–9] Globally, the burden of falls has increased significantly, with total deaths and disability nearly doubling since 1990.[4 10] Several countries, including the Solomon Islands, India and Vietnam, report the highest rates of fall-related mortality, highlighting gaps in healthcare capacity and access.[4] In Canada and other nations, the older adult population is projected to double by 2050.[2] With the increase in fall rates, there will be severe ramifications for individuals, families and the global healthcare system.[5] It is crucial for countries to enhance their healthcare infrastructure to ensure that older adults have sufficient access to fall prevention programmes.

Fall prevention programmes play a vital role in enhancing the quality of life and physical function of older adults while alleviating the socio-economic impact on the healthcare system.[11] Current guidelines recommend that all older adults receive advice on fall

prevention and physical activity.[12] Research shows that comprehensive intervention programmes that combine exercise, medication management and education can be effective.[13] Additionally, the introduction of telehealth and recent technological advancements using smart home technology and artificial intelligence have shown promise in decreasing fall rates among community-dwelling older adults.[14 15] However, it is essential to note that evidence-based exercise programmes that focus on challenging balance, completed at least 3 hours per week, provided year-round, are the most impactful in reducing falls.[16–19]

Global guidelines and several systematic reviews strongly advocate for the implementation of evidence-based fall prevention community programmes.[12 20 21] In Canada, most community-based fall prevention exercise programmes do not include the recommended evidence-based exercise dosage and parameters to provide the desired effect of balance improvement and fall reduction.[18 22 23] Touchette *et al* reported that only 6% of 140 Canadian exercise programmes identified in a survey of instructors were evidence-informed.[23] Despite the abundance of evidence available in the literature, community-dwelling older adults, similar to older adults residing in institutions such as hospitals and long-term homes, encounter significant challenges in implementing evidence-based fall prevention practices.[24–29] Research indicates that these barriers are complex and multifactorial.[25 27 30 31] For instance, several challenges arise regarding the feasibility and financial costs associated with training a physical therapist or exercise physiologist to implement evidence-based programmes and offer further fine-tuning to ensure that those programmes are delivered in a manner that meets the standard of practice.[31] Even when implementation is successful, sustaining evidence-based fall prevention programmes remains a challenge. Generally, most community-based health programmes struggle to persist over time, often failing to optimise allocated resources and maintain long-term benefits.[32 33]

'Sustainability' has been defined as the capacity of a programme or intervention to sustain evidence-based programming and its benefits over time, even after formal funding has ended.[34 35] Although the concept of sustainability is characterised by a significant lack of comprehensive information and inconsistent definitions in the literature,[36 37] various terms have been used interchangeably to denote sustainability in the literature, such as 'institutionalisation', 'durability', 'maintenance' and 'routinisation'.[35 38 39] Sustainability is deemed crucial for several reasons: (1) it helps to achieve the desired benefits for both participants and the community, (2) it aids in maximising the limited available resources, (3) it takes several years to detect health outcomes and impacts within a community and (4) if an implemented programme is not sustained and subsequently dissolves without planning, it will affect community support and trust in future programmes.[32]

In recent years, there has been debate about the terminology used in the sustainability literature. Some papers have differentiated concepts in sustaining programmes.[40–42] 'Sustainment', a term used in the literature, refers to the ongoing use of processes and practices that can be measured as an outcome maintained over time.[43] 'Spread' is discussed in the literature as a replication process of an intervention from one part of an organisation to another or within a health system.[42] Various researchers have connected these concepts, as sustainment directly influences sustainability efforts, and the continued use of an intervention will affect the overall sustained benefits.[40 44 45] Sustainability will also inadvertently impact the spread of intervention, as the diffusion throughout various parts of the same organisation or among different organisations requires a certain level of retention and maintenance for a successful spread of intervention.[40 41 43 45 46]

Furthermore, Chambers *et al* elaborated on the theme of sustainability, describing it as a dynamic concept that requires adaptation depending on the contextual environment to which it is applied to ensure a long-term programme.[44] They also emphasised the importance of sustainment, which is defined as the ongoing use and process of sustainable practices that are effectively incorporated into daily operations and adjusted to evolving conditions over time. Song *et al* suggested that sustainability, sustainment and spread interact collectively and can be classified under the sustainability phenomena.[45] This term encompasses the continuation and routinisation of programmes along with their integration and spread within the healthcare system. Similarly, sustainability will be defined as the ongoing benefits derived from practices, processes or work routines while also describing their broad spread and diffusion within the healthcare system. For the purposes of this proposed scoping review, sustainability and sustainability phenomena will be used interchangeably (see table 1).

In a systematic review, Lovarini *et al* identified several factors affecting the sustainability of community-based fall prevention programmes. However, the systematic review focused on multimodal approaches such as pharmacological intervention, telehealth and a component of exercise programmes.[47] Furthermore, the paper highlighted specific challenges with the need for theories designed for sustainability at the organisational level.[47] Since the review was published, there has been an increase in articles describing exercise-based fall prevention programmes delivered in the community, which could offer insights into theories explicitly designed for programme sustainability at the organisational level.[41 48–50] To our knowledge, no research has systematically reviewed the evidence on the sustainability of exercise-based fall prevention programmes. Our objective is to review the available evidence describing sustainability and its phenomena in the context of community-based exercise fall prevention programmes. We aim to understand the factors influencing sustainability in these programmes and identify

Table 1 Key terms from the article along with their definitions

Terms	Definition
Sustainability	Refers to the ability to maintain process or practice over time. It emphasises the necessity of ensuring that the sustained benefits associated with these practices, processes or work routines are effectively incorporated within the system.[33 34 43] In this proposed scoping review, the terms sustainability and sustainability phenomena will be considered synonymous.
Sustainment	Refers to the ongoing use of processes and practices that can be measured as an outcome maintained over time.
Spread	Refers to the process of disseminating successful interventions, practices or innovations from one organisation, community or setting to others.[40 59]
Sustainability phenomena	An umbrella term that encompasses a dynamic concept linking sustainment, sustainability and spread. The phenomenon of sustainability refers to the observable patterns, dynamics and influences that emerge as an intervention moves beyond its initial implementation phase and becomes ingrained within an organisation. These phenomena illustrate how interventions evolve and disseminate within the organisation and how they continue to deliver value over time in a sustainable manner.[44 45]
Physical activity	Any movement of the body caused by skeletal muscles that results in energy expenditure. It can be quantified based on its intensity, duration and frequency.[60 61]
Exercise	A planned, structured and repetitive form of physical activity that is performed with the goal of improving or maintaining physical fitness and health.[60 61]

various strategies that could help develop more sustainable fall prevention programming.

METHODS AND ANALYSIS

The proposed scoping review will use the Joanna Briggs Institute methodology for scoping reviews and the framework proposed by Peters *et al*.[51] The synthesis will also adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews framework.[52] Our synthesis will examine the sustainability of community exercise fall prevention programmes for older adults.

Research question

What factors influence the sustainability of community-based fall prevention exercise programmes?

Eligibility criteria

Population

Eligible studies will focus on exercise-based fall prevention programmes delivered to community-dwelling adults aged 50 and older. We will include both male and female older adults from this population. However, we will exclude studies involving older adults residing in long-term care facilities or hospitalised older adults.

Concept

Our scoping review will include studies describing programme sustainability of community-based exercise fall prevention programmes. Sustainability factors will be identified and organised from eligible studies with the Program Sustainability Assessment Tool (PSAT) domains as determined by Douglas *et al*.[53] The PSAT framework is represented by eight domains: environmental support, partnerships, organisation capacity, programme evaluation, programme adaptation, communications and strategic planning. The PSAT is a reliable assessment instrument that can be used to measure a public health programme's capacity for sustainability.[53 54]

Context

Studies eligible for inclusion in our scoping review will focus on the sustainability of exercise-based fall prevention programmes implemented in community settings. Publications relating to adults residing in long-term care or nursing homes, grey literature and other knowledge syntheses will be excluded. There will be no geographic limitations, and only the literature published in English will be considered.

Search strategy

A search of Medline, EMBASE, Cumulative Index to Nursing and Allied Health Literature, Academic Search Premier, APA PsycINFO and SPORTDiscus will be conducted. Author IA-A developed the search method in consultation with an experienced librarian. No limitation will be placed on the search strategy, including no restrictions on the language and the publication date. This study will use a complete search strategy that employs keywords, relevant subject headings (MeSH) and Boolean terms 'AND' and 'OR' to identify potential studies. The search strategy, including all identified keywords and index terms, will be adapted for each included database. Keywords and search terms were identified from preliminary findings and previous systematic review literature on sustainability and exercise-based fall prevention.[16 38 39 47] This process also included validation using the Peer Review of Electronic Search Strategies checklist in collaboration with a librarian to ensure the search strategy's accuracy.[55] Articles from the database search will be compiled into the Covidence software manager for screening and text

review and placed for removal of duplicate studies[56] (see online supplemental appendix I).

Study selection

Studies identified from the database searches will be imported into Covidence software to collate database searches, removing duplicates, screening and data extraction.[56] Two reviewers will independently use Covidence to conduct title and abstract screening, full-text screening and data extraction. Reasons for excluding sources of evidence at full-text screening that do not meet the inclusion criteria will be recorded and reported in the knowledge synthesis. Any discrepancies or disagreements that arise with the screening process will be addressed through a discussion by the review team until a consensus is reached. The results of the search and the study inclusion process will be reported in full in the final scoping review and presented in a PRISMA flow diagram.[52]

Data extraction

The data extraction tool will be created in Covidence to obtain relevant information from eligible studies based on the inclusion criteria (see online supplemental appendix I). This information will be extracted and corroborated by two independent reviewers. There will be three main categories of data retrieved from the studies. First, the study description will be captured, including publication date, author(s), study location, paper's aim/purpose, study participants, study design and conclusion. Second, we will extract the specifics of the exercise programme from each study based on the 16-point checklist Consensus on Exercise Reporting Template (CERT).[57] The CERT template consists of information on exercise programmes only identified within the study or provided by the authors (see online supplemental appendix I). CERT will provide a standardised way of collecting exercise programme descriptions extracted from eligible studies. Additionally, we will determine if the programmes are evidence-based, based on the recommendations by Sherrington *et al*.[16] Third, we will extract information relevant to the eight domains in the PSAT framework: environmental support, partnerships, organisation capacity, programme evaluation, programme adaptation, communications and strategic planning. Each PSAT domain will be mapped on a spreadsheet, and concepts within the eligible studies identified will be described within the appropriate column. The subscale from the PSAT will be used to measure each eligible study's core domain sustainability as determined by the information provided in the article (See online supplemental appendix I).

Relevant data will be extracted from eligible papers included in the scoping review by two independent reviewers using a data extraction tool. The draft data extraction tool will be modified and revised as necessary while extracting data from each included evidence source. Modifications, if any, will be detailed in the final scoping review publication. Any disagreements will be resolved through discussion or with additional reviewers and the review team. If appropriate, authors of papers will be contacted to request missing or additional data, where required. Data from relevant articles will be systematically organised based on key study information (eg, year, study design, country, etc), components of the falls prevention study using the CERT framework and sustainability insights derived from the PSAT domains. This information will be clearly presented in a descriptive tabular format referred to as data charting.[58] Key findings from the extracted data will be summarised and structured to address the paper's objectives. The planned start time for data screening, charting and extraction will be in spring 2025, rolling into spring 2026.

Patient and public involvement statement

Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

ETHICS AND DISSEMINATION

As this is a scoping review, we do not require an ethics approval. We plan to disseminate our report findings to scientists, healthcare professionals and decision-makers. To reach these individuals, our results will be conveyed through published articles in leading scientific journals and presentations at appropriate local (ie, knowledge translation and falls prevention conferences) to distribute our research findings.

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Contributors IA-A and DSK designed the original scoping protocol in consultation with KS and DB. All authors listed above have made significant contributions to the initial drafting of this manuscript and have granted approval for its final submission. IA-A will serve as the guarantor for this paper.

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