Evaluating the Hampshire County Council Steady and Strong Falls Prevention Programme

Project Summary

Study Title	Evaluating the Hampshire County Council Steady and Strong Falls Prevention Programme
Local Authority	Hampshire County Council
Planned study period	August 2023 to June 2024
Research aim/s	Our primary aims are to evaluate the effectiveness, fidelity, reach and implementation of two adapted Otago Exercise Programmes (OEP); incorporating standard OEP exercises into dance classes and pairing OEP to music. We will also conduct a brief economic evaluation of the service.
Study Methods	Mixed methods, including cost analysis
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Local Authority Contributors	Sarah Wallace – Consultant in Public Health Ellie Russell - Falls Prevention & Physical Activity Coordinator Abbie Twaits – Senior Public Health Practitioner
Funder	National Institute for Health and Care Research (NIHR) Award ID: 135190
Protocol version number and date	V1.0 August 2023

Plain English Summary

Background

Falls are a significant concern for adults over the age of 65 living in their own homes and in supported housing. Approximately one third of adults over 65 and one half of those over the age of 80 will fall at least once a year. Falls can lead to injuries such as fractures and can cause distress, a loss of independence, and reduced confidence. Hampshire has the third largest population of any county and a higher rate of older adults than the national average. To help reduce the risk of falling, the government recommends that people over the age of 65 should have access to exercise classes that improve their strength and balance. One such programme, the Otago Exercise Programme, contains 17 strength and balance exercises that can be completed in a group and at home. It has been shown to reduce the risk of falling in those over 65 and is used all over the country to help prevent falls.

Hampshire County Council provide training for exercise instructors to deliver the Steady and Strong programme, which aims to reduce the rate of falls across the county by offering exercise classes such as the Otago Exercise Programme. Hampshire County Council funds the training for exercise instructors to deliver the classes privately in the community and there are currently 99 classes offered across Hampshire. The Council would like to increase the amount of exercise classes in the Steady and Strong programme and have worked with a dance company to develop two new types of instructor training:

1. Otago with Dance: This class aims to build strength and balance through dancing.
2. Otago with Music: This class adds music to strength and balance exercises.

What are we doing?

The PHIRST-Light research team have been asked by Hampshire County Council to help evaluate these new classes. The Council would like to answer important questions such as how well the new exercise classes work at reducing someone's risk of falling, who comes to the classes, and how they are delivered.

Our main questions are:

- Do the new programmes improve strength and balance and can we compare these results to the original Otago Exercise Programme?
- Who takes part in the classes and do the classes attract different people?
- What do the people who take part think of the classes?
- What do the instructors think about the training and the classes?
- Are instructors delivering the classes as they were designed?
- How much does it cost to deliver the classes?

In this evaluation we will use different tools to answer these questions. This will include informal interviews with people who go to the classes, instructors, and members of the council to get their perspectives on the classes. It will also include measuring people's strength and balance at the beginning of the classes, after 3 months, and after 6 months. This is so that we can know how well the new classes are working compared to the original classes. We will also watch instructors deliver

their classes and will use a brief survey to ask the instructors and members of the council how much it costs to keep the classes going and whether this is something they can do going forward.

We are working with a group of public advisors who currently attend one of the Steady and Strong classes. This group has helped us to think about issues affecting local people who might take part in these classes. They will help us to make sure the way we are asking questions makes sense and will help us decide how we let people know about the findings of our study.

Contents

1. Evaluation details

1.1 Full evaluation title

Evaluating the Hampshire Steady and Strong Falls Prevention Programme

1.2 Funding

This evaluation is supported by the National Institute for Health and Care Research (NIHR) PHIRST initiative (Public Health Research funding stream).

Funders reference: **NIHR135190**

1.3 Core working team contact details

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2. Background

2.1 Overview of intervention to be evaluated and contextual information.

The service and the specific problem being addressed.

Falls present a significant public health concern in older adults living both independently and in supported housing. Approximately one third of adults over the age of 65 will fall at least once a year, increasing to half of those over the age of 80 (1). Falls can lead to personal injury, such as fracture and hospitalisation, alongside personal distress, loss of independence and reduced confidence. Injuries secondary to a fall cost the NHS more than £2.3 billion per year (2). Hampshire is the third most

populous county and has an aging population that is significantly higher than the national average (1 in 5 over age 65 compared to 1 in 6 nationally, as of 2020) (3). Across the county, the number of older adults at risk of falling was projected to rise to approximately 333,000 by 2023 (3). In 2017, Public Health England (PHE) produced a Falls and Fracture Consensus Statement (4) recommending that older people (age 65+) living in the community with low to moderate risk of falls should have access to strength and balance exercise programmes. Specifically, PHE noted that the training should be progressive and adaptable to participant needs (4). One such programme, the Otago Exercise Programme (OEP), is a widely evidenced exercise programme aiming to reduce falls-related injuries and absolute falls risk in older adults. The programme incorporates a series of 17 strength and balance exercises, designed to be completed within a group setting and with home practice encouraged (5).

Hampshire County Council coordinate training to deliver the Steady and Strong programme, which aims to reduce the rate of falls across the county by improving strength and balance through evidence-based falls prevention exercise programmes, including OEP. Hampshire County Council funds instructor training to deliver the classes privately in the community, alongside providing organisational and advertisement support. Currently there are 99 classes offered by trained private instructors across Hampshire, with approximately 1300 participants per year. However, to increase exercise class offerings in the community alongside potential reach and progression of these services, Hampshire County Council have commissioned the development of two new training curricula:

3. OEP Dance: in which strength and balance training principles informed by OEP are integrated into dance classes for older adults.
4. OEP to Music: in which traditional OEP exercises are completed to music.

These training curricula comprise one day of in-person training whilst OEP Dance training also incorporates a quality assurance visit from the curricula developers once delivering the class in the community. Community dance instructors meeting eligibility criteria will receive training in OEP Dance to integrate the OEP structure into their class choreography and dance activities with older adults (65+ years). For those without standard OEP training, this will be a prerequisite for completing the OEP Dance training. Instructors with standard OEP training without a dance background will be eligible to receive training in OEP to music. Following receipt of the training, instructors will be able to deliver these classes privately across the county.

To determine the effectiveness of the programmes, the focus of this evaluation will be on the functional outcomes obtained between the three programmes alongside a process evaluation focussing on programme fidelity, implementation, reach, and acceptability.

Review of existing evidence and context for dance-based interventions

Falls have been defined as 'an unexpected event in which the subject loses their balance and comes to land on the ground, floor, or lower level' (6). Factors including reduced lower limb strength, muscle weakness, poor balance, and physical impairments have been demonstrated to increase falls risk in older adults (7). To improve physical function, the UK's Chief Medical Officers recommend that older adults should engage in 150 minutes of moderate to vigorous physical activity, including two strength and balance sessions per week (8). In addition to the physical benefits of exercise, mental acuity and social independence are maintained when older adults remain autonomously active (9). However, despite these benefits, only 19% of those between ages 65 and 74 and only 11% of those over 75 meet aerobic and muscle-strengthening guidelines in the UK (10).

Falls prevention interventions targeting strength and balance have demonstrated reductions in the rate of falls in older adults by 21% (11). Included in this, OEP has been shown to improve a wide range of physical and cognitive outcomes including lower limb muscle strength, functional mobility, and cognitive function (12,13). Additionally, OEP demonstrates enhancements of factors that support improved wellbeing, including confidence in one's own balance, reductions in social isolation and fear of falling (14,15). Kyrdalen and colleagues (2014) demonstrated that improvements made to functional balance and muscle strength were greater when engaging in OEP as a group, rather than individually (16) . Group training has also been shown to improve adherence rates in comparison to individual training, by providing greater motivation to participants to perform exercises more effectively (17).

Although there is limited evidence that dance-based interventions reduce the rate of falls, there is more robust support for improvements in fall-related risk factors. Recent studies demonstrate that dance-based interventions reduce falls risk (18), improve gait and balance (19,20), posture (21), alongside improving lower body strength (22). Beyond physical improvements, dance training demonstrates higher adherence (87-92%; (19,23)) than for comparative strength training (56-79% (24,25). Broadly, literature demonstrates the benefits of dance in older age groups, particularly for fostering joy, play, pleasure, and a sense of physical freedom (26,27). Dance may therefore offer an alternative approach to reducing falls risk that is enjoyable and fosters greater adherence.

3. Co-production of the proposal

Partnership working is a core feature of the PHIRST initiative and will be incorporated throughout our evaluation. This evaluation has been co-designed by the PHIRST-Light team with Hampshire County Council, local partners and stakeholders. To accomplish this, we worked with Hampshire County Council to map key stakeholders and invited them to attend a series of online workshops (delivered via Microsoft Teams). Attendees ranged from public health, healthy aging, and physical activity local authority members, curriculum developers, an NHS physiotherapist with falls expertise, instructors, and two current class attendees (total N = 14). The focus of these workshops was to gain consensus on the primary research questions and explore the most appropriate methodology to answer those questions. Open dialogue was encouraged through a series of small breakout sessions and wider whole group discussions. Key elements to be tested within the programme logic model were defined, allowing drafting of a logic model and theory of change. This was presented for iteration at a second stakeholder session and finalised following feedback (see appendix 1). We proposed a series of research aims to test the theory of change and used this as a discussion point to reach consensus about the questions of greatest interest and importance across all stakeholders. During this process, it emerged that class attendees saw many positive benefits of the classes beyond functional fitness, including reductions in social isolation and improvements in activities of daily living and quality of life. These items were considered to be of importance and have been included in the evaluation. Stakeholders will continue working together to deliver and disseminate the evaluation through frequent communication and consultation, in the form of co-production workshops.

3.1 Public contribution

The PHIRST Light research team are committed to ensuring public voices are included throughout the entirety of each evaluation, with an additional emphasis on capacity building for effective and inclusive public contribution within local authorities. Following the principles promoted by the National Institute for Health and Care Research (NIHR) on patient and public involvement (PPI), The PHIRST-LIGHT team have established an overarching Public Advisory Group (PAG) comprising members of the public and local authority service users. All PPI activities are monitored by the PAG, which is co-ordinated by our PPI (Pam Rees) and academic PPI (Dr Jo Morling) leads. In addition to the PAG, we have supported the Hampshire team to form a project specific PPI group to advise on and assist with the evaluation design and delivery. This group is coordinated by two members of the PAG and comprises nine users of exercise classes across Hampshire (aged over 65 years). We will work with the group to co-produce recruitment strategies and materials that are accessible and inclusive, including wording of the interview guides, alongside developing our dissemination approach. We

envisage this occurring predominantly through online workshops and document review. Members of the group are reimbursed for their time in accordance with NIHR guidance on honorarium payments. Members of the PPI group have already been included as key stakeholders throughout the proposal development, ensuring lived experience voices inform the evaluation strategy. Thus far, we have held two PPI meetings in which the methodological approaches and questions were reviewed, with the received feedback shaping this proposal.

4. Key evaluation aims, objectives and research questions.

4.1 Evaluation aims and objectives

This evaluation aims to understand how effective the newly developed exercise programmes are at improving functional fitness (i.e. strength and balance) as proxy measures for falls risk. This aim has been refined through extensive discussions with stakeholders and reflects the feasibility of data collection. Given the extensive literature supporting OEP, a key component of this evaluation will be to determine whether OEP Dance and OEP to Music produce comparative outcomes to the standard OEP offering.

By expanding the current class offerings and formats, there is the potential to increase the number of people who are able and motivated to access the Steady & Strong programme. It will therefore be important to understand who attends which classes and why. As a result, a core facet of the evaluation will explore the impact of the newly developed training curriculum and community classes on uptake and retention, particularly across sociodemographic characteristics, geographic areas, and groups that traditionally experience health inequalities.

The evaluation will draw from the RE-AIM framework, which was developed over 20 years ago to address gaps in the translation of scientific evidence into policy and practice (28). The RE-AIM framework has become one of the most commonly used evaluation tools across the fields of public health and implementation science and comprises five key dimensions: reach, effectiveness (individual level), adoption, implementation (wider ecological levels), and maintenance.

Nested within the RE-AIM framework, six core concepts will be used to explore four of these domains through the following research questions:

Concept	**Research question**
Reach	Who takes part in the programmes? How many people attend and do the programmes reach different populations?

Effectiveness	Do the programmes improve functional fitness? Are the outcomes of the newly delivered programmes comparable to standard OEP?
Acceptability	What are class attendees' perceptions of the programmes?
Implementation (Fidelity)	What is delivered and is it delivered as intended?
Implementation (Maintenance)	What does it take to deliver the programmes and is this sustainable?
Cost analysis	How much does it cost to deliver the programmes?

5. Study design overview

5.1 Methods overview

This study will use a prospective observational design to compare programme outcomes and a mixed methods process evaluation to explore acceptability, fidelity and implementation of the programmes. Collection of comparative quantitative data will be conducted pre- and post-class attendance for new class enrollers in each of the three programmes. This will occur alongside a descriptive analysis of class registers and demographic information, allowing exploration of both effectiveness and reach. Qualitative data collection among class attendees, including specific sampling across sociodemographic characteristics and those who dropped out of the classes will explore acceptability of the classes, alongside barriers and facilitators for attending and other outcomes (such as improvements in quality of life domains). Similarities and differences in the emerging themes will be reviewed between programmes. To assess fidelity of class delivery, a checklist will be developed in line with the class curricula and each of the instructors will be observed and scored accordingly. Qualitative interviews will be conducted with instructors, local authorities and commissioning stakeholders to determine implementation factors alongside a brief quantitative measure of cost.

The table below illustrates the study sequence, with data collection occurring at baseline, 12 weeks, and 24 weeks for new attendees. This will likely mean staggered data collection as the classes may not be run concurrently. At 24 weeks from the study start date, we will also conduct qualitative interviews and cost analysis surveys with commissioning/ council stakeholders and instructors. We expect the study duration to be approximately one year from the time of study commencement.

Figure 1 below provides a graphic of the proposed methods.

Concept	Baseline	12 weeks	24 weeks
Reach	Routine data collection on class attendance and demographic breakdown (class registers, demographic questionnaires)	Routine data collection on class attendance	Routine data collection on class attendance
Effectiveness	Baseline functional and social measures (e.g. Sit-to-stand, Short FES-I)	Baseline functional and social measures (e.g. Sit-to-stand, Short FES-I)	Baseline functional and social measures (e.g. Sit-to-stand, Short FES-I)
Acceptability		Class attender qualitative interviews (n = 15)	
Implementation (Fidelity)		Fidelity visits with instructors (n = 15)	
Implementation (Maintenance)			Qualitative interviews with instructors and council stakeholders (n=23)
Cost analysis			Cost analysis surveys with instructors and council stakeholders (n=23)

5.2 Data Collection

<u>Qualitative data collection</u>

Class attender interviews (n = 15)

Approximately 15 individuals who were referred to and attended at least one class will be purposively sampled to complete individual interviews. Sampling will be purposive to help answer our research questions, ensuring sampling across areas and classes within Hampshire, attenders (those attending more than one class) versus non-attenders (only attended one class), and demographics, including ethnicity and gender. During the initial baseline session, instructors will provide newly enrolled class members with a participant information sheet and collect consent to participate in the evaluation. Training will be provided to instructors in advance. Recruitment for qualitative interviews will subsequently occur via sampling from class registers. Interviews will be conducted online or over the telephone and will last up to one hour.

An interview guide will be developed that explores the following topics relating to acceptability:

- Enjoyment of the programme
- Confidence during the classes and to be active more generally

- Motivation for attending the type of exercise programme and reasons for discontinuation
- Barriers and facilitators for attending
- Areas for strength and improvement related to each programme
- Social and daily living/quality of life outcomes
- Onward movement to other exercise programmes

Stakeholder interviews

A range of stakeholders including instructors, members of the local authority, and strategic policy makers and public health commissioners will be invited to participate in an individual interview exploring the implementation and sustainability of the different programmes. Understanding implementation at both an organisational and individual (instructor) level will likely require different questions. As a result, two interview guides will be developed and tailored to the stakeholder group.

Instructors (n=15):

All instructors who deliver the newly developed OEP classes alongside instructors who deliver the standard OEP class will be invited to participate in a semi-structured interview. The interview guide will include questions around:

- Confidence to deliver the programme/s and whether this differed by programme
- What support they felt they had or was needed
- Sustainability of the programmes, alongside barriers and facilitators to delivery
- Feedback on the acceptability and utility of the training sessions and any additional training that may be required

Local authority stakeholders (including core working team and strategic policy makers (n=8-10):

All stakeholders who are key to the commissioning and/or delivery of the programmes will be approached to participate in a semi-structured interview, with questions exploring:

- Supportive factors and challenges in the set up and implementation of each programme – including at the leadership and strategic policy making level
- Barriers and facilitators to successful ongoing delivery
- Decision-making related to funding and sustainability
- Confidence in instructor delivery and perceptions of the delivery model
- Unintended consequences

All interview guides will follow a semi-structured format allowing the researcher to explore areas of interest with the opportunity for participants to broach areas that had not been anticipated in

advance. As the instructors may teach a variety of these programmes, we will explore differences across the programmes. Snowball methods will be used to identify and recruit commissioning stakeholders.

Quantitative data collection

In addition to the qualitative data collection, quantitative tools including measures of functional fitness and social outcomes, class registers, fidelity checklists and online surveys will be used to address questions across four research domains: reach, effectiveness, fidelity and implementation.

Primary data

Functional measures

All new class starters for each of the three programmes will be approached to participate in the evaluation (recruitment occurring via class instructors). Following consent, participants will be asked to complete measures of functional fitness during their initial (baseline) class session, which will then be repeated at 12 and 24 weeks to assess prospective change. This will allow direct comparison of functional outcomes between each of the programmes. Importantly, feedback from both our PAG and stakeholder sessions highlighted not only the physical benefits of engaging in the exercise classes, but also the broader psychosocial impacts of engagement. As a result, we have integrated measures of psychosocial functioning into the baseline and follow-up assessments to ensure we are capturing the wider effects of the programmes.

Measures will include:

1. Timed up and go (TUG) test (29): This measure records the time taken to rise from a chair, walk three metres at a consistent speed, turn and walk back to the chair, and sit down. The measure demonstrates good inter- and intra-rater reliability and is widely used in falls prevention studies.
2. 30-second sit-to-stand (STS; (30): This measure requires individuals to stand up and sit down from a standard-height chair as many times as possible within 30 seconds.
3. TURN180 (31): Measure of dynamic postural stability, requiring individuals to complete a 180 degree turn. Previous research demonstrates that individuals who required more than four steps to complete the turn are at increased risk of falling (32)
4. Short Falls Efficacy Scale International (Short FES-I; (33): This Short FES-I is a seven-item measure assess concern about falling. It demonstrates comparable internal and retest reliability to the original FES-I measure.

5. CONFbal Scale (34): This is a brief 10-item measure used to assess balance confidence across a range of daily activities in older adults. It has been widely utilised in falls prevention research.
6. EQ-5D-5L (35): This measure provides insight into health-related quality of life across five domains and has been extensively used in health and care research.
7. UCLA Loneliness Scale (36): 20-item tool used to assess subjective feelings of loneliness or social isolation.
8. Lubben Social Network Scale-6 (37): Six item measure on social network and connectedness with family and friends, including perceived level of support.

Fidelity Assessment (n = 15)

To determine the fidelity of each programme, we will use the Template for Intervention Description and Replication (TIDieR) checklist (38) to describe the elements of each programme. The TIDieR checklist was developed to promote standardised descriptions of trial interventions, allowing for greater comparison and replicability between studies (38). It has been widely used in health research and provides a template for fidelity monitoring. Drawing from the training curriculums, we will use the TIDieR checklist to develop a fidelity framework in collaboration with the developers of the curriculum, members of the local authority, and the instructors themselves. The framework will then be piloted during instructor training for each programme to ensure the content and structure encompass all elements of the programmes.

This framework will be applied through fidelity observations. A trained observer (either a member of the research team or trained OEP instructors external to this evaluation) will observe one class per instructor and use the framework to determine whether all aspects of the intervention have been included in the expected format. Data from these observations will be triangulated with qualitative implementation data to explore the context surrounding delivery of the programmes and their fidelity. We expect approximately 15 instructors to be involved in the evaluation, spread across each of the three exercise programmes.

Cost analysis surveys (n = 23)

Feasibility and sustainability of the programmes likely depends on the cost effectiveness of each programme. Local authority stakeholders and commissioners, and instructors involved in the implementation portion of the evaluation will be sent a brief online survey to assess the cost of developing and delivering the programmes. This will include:

- Cost per participant

- Setup, fixed, and variable costs

Routine data

Class registers

We will undertake a descriptive analysis of weekly class registers to determine uptake and reach of each programme. Use of descriptive statistics will allow comparison between the programmes by demographic breakdowns. We will request the following information from these registers: Attendance rates (and consistency), referral route, recorded falls during class, self-reported falls outside of class. We will also collect demographic data from participants, including the following characteristics: Age, gender, ethnicity, postcode (allowing calculation of deprivation index), number of medications, disability status, and clinical frailty score (assessed through the Rockwood Frailty scale).

Data analysis

All qualitative data will be transcribed verbatim and analysed using NVivo software (QSR International Ltd, Melbourne, Australia). Data will be analysed using an inductive thematic approach (39). During the first phase of analysis, a researcher will conduct a preliminary scan of the data, allowing generation of initial codes for data extraction in line with the primary research questions. The analysis will then be re-focussed to sort and group the codes into analytical categories or themes. A 'constant comparative' method will be used to compare individual data items with the rest of the data, ensuring that the preliminary themes retained importance with additional interviews (40). To ensure reliability of the coding system, a second researcher will independently code and compare 20% of the interview transcripts. During the second phase, themes will be refined to ensure data cohere together meaningfully, whilst themes are clear and distinct. Themes will be reorganised and collapsed as required. Finally, a detailed analysis will be conducted for each theme. This process and the subsequent thematic outcomes will be reviewed in collaboration with PAG members and stakeholders, allowing finalisation of the themes.

Descriptive analysis will be performed on all quantitative variables; frequencies and percentages will be presented for categorical variables and means with standard deviations for continuous variables (or median and interquartile range if not normally distributed). Proportions will be presented for demographic variables. Prospective changes to functional scores will be assessed through comparative methods, including paired sample t-tests and repeated measures ANOVA or Wilcoxon Signed Rank test (for non-normal variables).

Sample sizes:

We plan to collect fidelity and implementation data from instructors (n=15) and local authority/commissioning stakeholders (n=8-10) involved in the evaluation. In line with guidance on conducting qualitative studies (41), qualitative interviews will be conducted with approximately 15 class attenders, or until data saturation occurs, and all council stakeholders involved in the evaluation. Approximately fifteen instructors will be taking part in the evaluation, from across each of the three exercise programmes, all of whom will be invited to participate in a qualitative interview. Average class sizes range from 10-15 participants, thus we envisage that demographic and quantitative data will be collected for a minimum of 120 class participants, accounting for 20% who may decline to participate.

6. Data management

The University of Nottingham will serve as data controller for the wider PHIRST-LIGHT team and will be responsible for data management and data protection processes. A data management plan will be submitted for ethical approval. Interview data will be collected using GDPR compliant software (e.g., Microsoft Teams). De-identified data will be used for data analysis and will be stored in a shared OneDrive folder, only accessible to research team members. However, certain personally identifiable information will need to be collected as part of the evaluation. All personally identifiable information, such as contact details or video/audio recordings, will be stored in separate password protected folders. Contact details will be deleted at the conclusion of the project.

A data sharing agreement will be set up between each of the instructors and the University of Nottingham to enable the transfer of primary data electronically. All data will be transferred over secure, encrypted connections. Consent forms and data will be stored electronically or in a secure locked facility for a period of 7 years. After 7 years, all data will be destroyed via deletion or shredding.

7. Ethics and governance

Ethical approval will be sought from University of Nottingham Faculty of Medicine and Health Sciences.

8. Timeline and milestones

The following Gannt chart outlines the key project milestones and completion timeline:

Key Milestones	***August 2023***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan 2024***	***Feb***	***March***	***April***	***May***	***June***	***July***	***Aug***	***Sept***	***Oct***
Ethics application	X														
Data collection		X	X	X	X	X	X	X							
Analysis completed							X	X		X	X				
Preparation of report											X	X			
Present findings to Hampshire County Council												X			
Submit final report													X		

9. Outputs

9.1 Dissemination plan

The PHIRST Light team will work with stakeholders to co-produce an impact and dissemination strategy unique to this project. Potential impact will be mapped by audience groups across the short, medium, and longer-term, including how this impact work will be delivered at each stage. We will actively engage with the local PPI group, PAG and wider stakeholder group to consider how the evaluation findings are most effectively communicated, alongside formalising a knowledge mobilisation plan.

Broadly, dissemination will occur through the following channels:

- The PHIRST website, including publication of this protocol.
- Public facing summaries of the findings (print and web formats)
- Creative outputs such as video and interactive content
- NIHR final evaluation report
- PHIRST Light and PHIRST social media channels
- Conference presentations and peer-reviewed, open access journal articles
- Dissemination through professional networks
- Local Authority workshops and events

10. References

1. GOV.UK [Internet]. [cited 2023 Jun 21]. Falls: applying All Our Health. Available from: https://www.gov.uk/government/publications/falls-applying-all-our-health/falls-applying-all-our-health

2. Introduction | Falls in older people: assessing risk and prevention | Guidance | NICE [Internet]. NICE; 2013 [cited 2023 Jun 21]. Available from: https://www.nice.org.uk/guidance/cg161/chapter/introduction

3. Ageing well 2016 to 2020 [Internet]. [cited 2023 Jun 21]. Available from: https://www.hants.gov.uk/socialcareandhealth/publichealth/jsna/ageingwellsummary/ageingwell

4. GOV.UK [Internet]. 2017 [cited 2023 Jun 21]. Falls and fractures: consensus statement and resources pack. Available from: https://www.gov.uk/government/publications/falls-and-fractures-consensus-statement

5. Gardner MM, Buchner DM, Robertson MC, Campbell AJ. Practical implementation of an exercise-based falls prevention programme. Age Ageing. 2001 Jan;30(1):77–83.

6. Hauer K, Lamb SE, Jorstad EC, Todd C, Becker C, (on behalf of the profane-group). Systematic review of definitions and methods of measuring falls in randomised controlled fall prevention trials. Age Ageing. 2006 Jan 1;35(1):5–10.

7. Lloyd BD, Williamson DA, Singh NA, Hansen RD, Diamond TH, Finnegan TP, et al. Recurrent and Injurious Falls in the Year Following Hip Fracture: A Prospective Study of Incidence and Risk Factors From the Sarcopenia and Hip Fracture Study. J Gerontol Ser A. 2009 May 1;64A(5):599–609.

8. GOV.UK [Internet]. 2020 [cited 2023 Jun 28]. Physical activity guidelines: UK Chief Medical Officers' report. Available from: https://www.gov.uk/government/publications/physical-activity-guidelines-uk-chief-medical-officers-report

9. Vagetti GC, Barbosa Filho VC, Moreira NB, Oliveira V de, Mazzardo O, Campos W de. Association between physical activity and quality of life in the elderly: a systematic review, 2000-2012. Braz J Psychiatry. 2014 Jan 17;36:76–88.

10. NDRS [Internet]. [cited 2023 Jun 28]. Adult physical activity. Available from: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2021-part-2/physical-activity

11. Sherrington C, Michaleff ZA, Fairhall N, Paul SS, Tiedemann A, Whitney J, et al. Exercise to prevent falls in older adults: an updated systematic review and meta-analysis. Br J Sports Med. 2017 Dec 1;51(24):1750–8.

12. Kocic M, Stojanovic Z, Nikolic D, Lazovic M, Grbic R, Dimitrijevic L, et al. The effectiveness of group Otago exercise program on physical function in nursing home residents older than 65years: A randomized controlled trial. Arch Gerontol Geriatr. 2018;75:112–8.

13. Shubert TE, Smith ML, Jiang L, Ory MG. Disseminating the Otago Exercise Program in the United States: Perceived and Actual Physical Performance Improvements From Participants. J Appl Gerontol Off J South Gerontol Soc. 2018 Jan;37(1):79–98.

14. Chiu HL, Yeh TT, Lo YT, Liang PJ, Lee SC. The effects of the Otago Exercise Programme on actual and perceived balance in older adults: A meta-analysis. PLoS ONE. 2021 Aug 6;16(8):e0255780.

15. Martins AC, Santos C, Silva C, Baltazar D, Moreira J, Tavares N. Does modified Otago Exercise Program improves balance in older people? A systematic review. Prev Med Rep. 2018 Jul 10;11:231–9.

16. Kyrdalen IL, Moen K, Røysland AS, Helbostad JL. The Otago Exercise Program Performed as Group Training Versus Home Training in Fall-prone Older People: A Randomized Controlled Trial. Physiother Res Int. 2014;19(2):108–16.

17. Leijon ME, Faskunger J, Bendtsen P, Festin K, Nilsen P. Who is not adhering to physical activity referrals, and why? Scand J Prim Health Care. 2011 Dec 1;29(4):234–40.

18. Blanco-Rambo E, Bandeira-Guimarães M, Vieira AF, Pietta-Dias C, Izquierdo M, Cadore EL. Dance as an Intervention to Reduce Fall Risk in Older Adults: A Systematic Review With a Meta-Analysis. J Aging Phys Act. 2022 Dec 1;30(6):1118–32.

19. Granacher U, Muehlbauer T, Bridenbaugh SA, Wolf M, Roth R, Gschwind Y, et al. Effects of a Salsa Dance Training on Balance and Strength Performance in Older Adults. Gerontology. 2012 Jan 6;58(4):305–12.

20. Eyigor S, Karapolat H, Durmaz B, Ibisoglu U, Cakir S. A randomized controlled trial of Turkish folklore dance on the physical performance, balance, depression and quality of life in older women. Arch Gerontol Geriatr. 2009 Jan 1;48(1):84–8.

21. Kattenstroth JC, Kalisch T, Holt S, Tegenthoff M, Dinse H. Six months of dance intervention enhances postural, sensorimotor, and cognitive performance in elderly without affecting cardio-respiratory functions. Front Aging Neurosci [Internet]. 2013 [cited 2023 Jun 21];5. Available from: https://www.frontiersin.org/articles/10.3389/fnagi.2013.00005

22. Holmerová I, Machácová K, Vanková H, Veleta P, Jurasková B, Hrnciariková D, et al. Effect of the Exercise Dance for Seniors (EXDASE) Program on Lower-Body Functioning Among Institutionalized Older Adults. J Aging Health. 2010 Feb 1;22(1):106–19.

23. Franco MR, Sherrington C, Tiedemann A, Pereira LS, Perracini MR, Faria CSG, et al. Effect of Senior Dance (DanSE) on Fall Risk Factors in Older Adults: A Randomized Controlled Trial. Phys Ther. 2020 Apr 17;100(4):600–8.

24. Picorelli AMA, Pereira DS, Felício DC, Dos Anjos DM, Pereira DAG, Dias RC, et al. Adherence of older women with strength training and aerobic exercise. Clin Interv Aging. 2014 Nov 24;9:323–31.

25. Seguin RA, Economos CD, Palombo R, Hyatt R, Kuder J, Nelson ME. Strength training and older women: a cross-sectional study examining factors related to exercise adherence. J Aging Phys Act. 2010 Apr;18(2):201–18.

26. Pezdek K, Doliński W, Zygmont A. Senior Women's Dance: From Pleasure to Emancipation. Int J Environ Res Public Health. 2022 Jan;19(10):6318.

27. Chipperfield SR, Bissell P. 'I Hear the Music and My Spirits Lift!' Pleasure and Ballroom Dancing for Community-Dwelling Older Adults. J Aging Phys Act. 2023 Apr 1;31(2):276–88.

28. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. Am J Public Health. 1999 Sep;89(9):1322–7.

29. Podsiadlo D, Richardson S. The timed 'Up & Go': a test of basic functional mobility for frail elderly persons. J Am Geriatr Soc. 1991 Feb;39(2):142–8.

30. Jones CJ, Rikli RE, Beam WC. A 30-s chair-stand test as a measure of lower body strength in community-residing older adults. Res Q Exerc Sport. 1999 Jun;70(2):113–9.

31. Simpson JM, Worsfold C, Reilly E, Nye N. A Standard Procedure for Using TURN180: Testing dynamic postural stability among elderly people. Physiotherapy. 2002 Jun 1;88(6):342–53.

32. Nevitt MC, Cummings SR, Kidd S, Black D. Risk Factors for Recurrent Nonsyncopal Falls: A Prospective Study. JAMA. 1989 May 12;261(18):2663–8.

33. Kempen GIJM, Yardley L, Van Haastregt JCM, Zijlstra GAR, Beyer N, Hauer K, et al. The Short FES-I: a shortened version of the falls efficacy scale-international to assess fear of falling. Age Ageing. 2008 Jan 1;37(1):45–50.

34. Simpson J, Worsfold C, Hawke J. Balance Confidence in Elderly People the CONFbal Scale. Age Ageing. 1998 Jan 1;27(suppl_2):57-b.

35. Rabin R, de Charro F. EQ-5D: a measure of health status from the EuroQol Group. Ann Med. 2001 Jul;33(5):337–43.

36. Russell D, Peplau LA, Ferguson ML. Developing a measure of loneliness. J Pers Assess. 1978 Jun;42(3):290–4.

37. Lubben J, Blozik E, Gillmann G, Iliffe S, von Renteln Kruse W, Beck JC, et al. Performance of an abbreviated version of the Lubben Social Network Scale among three European community-dwelling older adult populations. The Gerontologist. 2006 Aug;46(4):503–13.

38. Hoffmann TC, Glasziou PP, Boutron I, Milne R, Perera R, Moher D, et al. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. BMJ. 2014 Mar 7;348:g1687.

39. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006 Jan 1;3(2):77–101.

40. Pope C, Ziebland S, Mays N. Analysing qualitative data. BMJ. 2000 Jan 8;320(7227):114–6.

41. Hennink M, Kaiser BN. Sample sizes for saturation in qualitative research: A systematic review of empirical tests. Soc Sci Med 1982. 2022 Jan;292:114523.

11. Appendix 1: Logic model