NIHR | Applied Research Collaboration Greater Manchester

MANCHESTER 1824

Rapid Evidence Synthesis: Digital tools in residential care settings (part I): Update for SafeSteps and RESTORE2-mini (Soft Signs)

Dr Gill Norman [1,2]

[1] NIHR Applied Research Collaboration Greater Manchester (ARC-GM)

[2] University of Manchester

Cite as:

Norman G. (2023) Rapid Evidence Synthesis: Digital tools in residential care settings (part I): Update for SafeSteps and RESTORE2-mini (Soft Signs). NIHR ARC Greater Manchester: University of Manchester.

Rapid Evidence Synthesis:

Rapid Evidence Syntheses (RES) are produced by the National Institute for Health and Care Research (NIHR) Applied Research Collaboration Greater Manchester (ARC-GM). The methods used are based on a framework set out in Norman et al. 2022 and previously registered on the Open Science Framework (OSF).[a,b]

RES use evidence synthesis approaches and draw on the GRADE Evidence to Decision framework[c] to provide rapid assessments of the existing evidence and its relevance to specific decision problems. In the first instance they focus on evidence from guidance and existing evidence syntheses. They are undertaken in a real-time context of decision-making around adoption of innovative health technologies and are designed to provide a "good-enough" answer to inform decision problems in a short timescale. RES methods are flexible and adaptive. They have evolved in response to user feedback and differ depending on the nature of the assessment undertaken.

RES are not intended to serve as a substitute for a systematic review or rapid review of evidence.

We welcome feedback and are particularly interested to hear how you have used this Rapid Evidence Synthesis.

Please send any queries or comments to:

Mike Spence
Senior Programme Lead
NIHR Applied Research Collaboration Greater Manchester
michael.spence@manchester.ac.uk

Additional information:

This work was undertaken by the National Institute for Health Research (NIHR) Applied Research Collaboration Greater Manchester (ARC-GM). The views expressed are those of the author and not necessarily those of the NIHR or the Department of Health and Social Care.

[a] Norman, G. Rapid evidence synthesis to support health system decision making. *OSF registration.* 2020 [cited 2023]; Available from: osf.io/hsxk5

[b] Norman, G., et al., Rapid Evidence Synthesis To Enable Innovation And Adoption in Health and Social Care. *Systematic Reviews*, 2022. 11: p. 250. https://doi.org/10.1186/s13643-022-02106-z

[c] Alonso-Coello, P., et al., GRADE Evidence to Decision (EtD) frameworks: a systematic and transparent approach to making well informed healthcare choices. 1: Introduction. *BMJ,* 2016. 353: p. i2016.

1. Summary

We identified limited additional evidence for the updates of the RES for SafeSteps and RESTORE2-mini (Soft Signs) respectively.

1.1 SafeSteps

In this update we identified evaluations of SafeSteps as a COVID-19 tracker. Findings from these may be indirectly relevant to its use as a falls prevention tool as they identify factors related to uptake and use. Among these were the positive value of co-production, compatibility with existing structures/processes and extensive training.

1.2 Apps for falls prevention

We did not find highly relevant evidence syntheses of apps for falls prevention in residential care. A recent high-quality cluster-RCT provided evidence that an intervention (Guide to Action for Care Homes) which included an app was probably effective in reducing the rate of falls in care home residents. The authors suggested that co-design and piloting were key to its success and that implementation research is needed to support wider roll-out.

1.3 Falls prevention

We identified a recent clinical practice guideline for fall prevention in residential settings and hospitals. This was based on a systematic review of RCTs and produced strong recommendations for: multifactorial interventions, professionally supported body exercise interventions, and education and counselling interventions. Not recommended were the use of a specific assessment tool for fall risk assessment, low-floor beds in hospitals, or body exercise interventions in frail residents.

1.4 RESTORE2-mini (Soft Signs)

In this update we identified limited additional evidence for RESTORE2-mini (Soft Signs). We found a scoping review of decision-support tools for early detection of infections in older people. This included five tools developed for nursing or care homes of which two targeted detection of non-specific infection. One of these was identified in the previous version of this RES; the second is newly identified. This tool was specifically adapted for the UK. It was not assessed for effectiveness but was considered useful, and to have face validity by research participants.

2. Methods

2.1 Description of the intervention

The interventions considered are the SafeSteps fall prevention tool and the RESTORE2-mini (Soft Signs) for identification of signs of possible physical deterioration. The fall prevention tool is an app, while the RESTORE2-mini (Soft Signs) is available as a digital tool or a downloadable paper-based form. Both tools are designed to be used by carers for older adults in residential care settings.

- SafeSteps fall prevention app was the subject of a previous RES in February 2020.
- RESTORE2-mini (Soft Signs) was included in a RES on RESTORE2 in July 2020.

2.2 Key questions

The following key questions have been identified:[d]

Question 1: What is the updated evidence for the questions addressed in the February 2020 RES for SafeSteps (summarised here):

- What is the evidence for the effect of the SafeSteps app on falls in older people in residential care settings?
- What is the evidence for the effect of apps on falls in older people (in residential care settings)?
- What is the evidence for the effect of risk assessments and any associated interventions for older people (in residential care settings) in preventing falling?
- What is the evidence for the effect of interventions to prevent/reduce falls (in residential care settings)?

Question 2: What is the updated evidence for the questions addressed in the July 2020 RES for RESTORE2 as they relate to RESTORE2-mini (Soft Signs) (summarised here):

- What is the effect of using RESTORE2 on outcomes for care home residents?
- What is the effect of tools like RESTORE2 on outcomes for care home residents?
- What is the reliability of the RESTORE2 in identifying care home residents who are at risk of deterioration compared to other methods or routine care?

We consider the following additional questions in a subsequent RES:

Question 3: What is the evidence for the effectiveness and safety of digital versions of falls prevention tools for older people living in residential care settings compared to paper-based versions?

[d] Please note that an RES will answer only as many questions for an intervention as are necessary to provide a useful answer. We will therefore focus in the first instance on the direct evidence for the interventions SafeSteps and RESTORE2-mini (Soft Signs).

Question 4: What is the evidence for the effectiveness and safety of digital versions of tools for identification of possible physical deterioration for older people living in residential care settings compared to paper-based versions?

Question 5: What is the evidence for the effectiveness and safety of using multiple health assessment tools for older people living in residential care settings compared to single or fewer tools?

2.3 Search

We conducted MEDLINE and Cochrane Library searches in January 2023. For Q1 we used terms for the intervention "SafeSteps", and wider terms related to the three facets of mobile or digital technology or mHealth; falls; older people; and residential care. We also received information via personal communication. For Q2 we used terms for the intervention "RESTORE2" and "Soft Signs" together with wider terms related to facets of deterioration assessment, detection or recognition; older people; and residential care. We used forward citation tracking and checked references of identified publications. We also looked at relevant websites.

2.4 Inclusion criteria

2.4.1 Population

Older people living in residential care settings. We accepted authors' definitions of older people but anticipated that participants in included studies would have a mean age above 65 years. We accepted authors' definitions of residential care settings but anticipated that studies would take place in settings identified as nursing homes, residential homes or care homes. For some aspects of Q1 we anticipated that we might also need to consider evidence relating to older people living in the community, but prioritised evidence on those living in residential care.

2.4.2 Intervention

We considered the interventions of interest (SafeSteps and RESTORE2-mini (Soft Signs) in the first instance for Q1-Q4. However we anticipated that there may be limited evidence available, particularly in relation to Q3 and Q4. We therefore considered evidence relating to interventions within similar categories in relation to each question. For Q5 we anticipated that the evidence would relate to the wider categories of assessment tools and the intervention is use of multiple assessment tools.

2.4.3 Comparator

For Q1 and Q2 comparators are usual care, alternative approaches to care or assessment. In some cases evidence may only be identified from studies with no comparator. For Q3 and Q4 comparators are paper-based assessments. For Q5 comparators are assessments using single or fewer tools.

2.4.4 Outcomes

For Q1 and Q3 primary outcomes are falls resulting in ED attendance or hospital admission and length of hospital stay as well as all-cause occurrence of these outcomes. Related outcomes such as falls, falls resulting in injury, and recurrent falls are also relevant. For Q2, Q4 and Q5 the primary outcomes are ED attendance; hospital admission and length of hospital stay. Mortality is an outcome of interest for all questions.

2.4.5 Study design

We searched for existing evidence syntheses in the first instance. We anticipated that we would need to consider primary evidence for elements of Q1 and Q2 and potentially also for the other questions. Where we considered primary evidence, we focused on studies with the most rigorous design in the first instance.

3. Results

3.1 Interventions for falls prevention (question 1)

3.1.1 SafeSteps

Previously we identified no published research evidence on SafeSteps. In this update we also did not identify any published studies relating to use of SafeSteps for falls prevention. However there are two studies which are in press (accepted for publication) which evaluated use of the SafeSteps technology as a COVID-19 symptom tracker in residential care settings.(2, 3) These studies, undertaken by independent researchers, were a prospective cohort study and a mixed-methods case study.

The studies found that use of the SafeSteps tracker was not maintained over time in care homes where it was adopted, and its use was not associated with either COVID-19 levels or with staffing.(2) The uptake and use (and rate of decrease in use) of SafeSteps all varied between different localities assessed.(3) The reasons for these variations in use were explored and may be relevant to use of SafeSteps as a falls tracker. Identified factors for higher levels of use/uptake included: development in partnership with highly engaged local clinicians, ensuring compatibility with local processes and structures and familiarity with digital technology; mature remote monitoring capability and digital enablement; integration of primary care and social services; in-depth training and support; early implementation before routine COVID-19 testing and vaccinations became routine. Factors identified as reasons for non-optimal implementation included: rapid pace of implementation in conjunction with a pressurised care sector where there was limited access to skills training; lack of co-production with care homes; concurrent introduction of multiple other interventions for infection control; the fact that SafeSteps was not included in the primary care contract for care homes.

These studies are directly relevant as they look at the use of the technology underlying SafeSteps in the Greater Manchester context. They do not consider the outcomes relevant to this RES which looks at SafeSteps for falls prevention. However, most of the factors identified as relating to levels of use/uptake are likely to be relevant to SafeSteps in falls prevention.

3.1.2 Apps for falls prevention in residential care

Our previous RES identified evidence syntheses which were not directly relevant to the question of apps for fall prevention in residential care(4, 5) or were not a systematic review;(6) and RCTs which were also not directly relevant to this question. In this update we found some additional evidence syntheses.(7-11) Two of these were systematic reviews of apps (rather than systematic reviews of studies of apps).(7, 9)

Neither of the app reviews focussed directly on the question of falls prevention. One looked at mHealth for fall detection in the elderly.(9) This identified 18 eligible apps for android and IOS and concluded that they had good quality scores. These apps were aimed at use by older people themselves and were not limited to people in residential care. A second app review looked at apps to support communication between caregivers and residents in long-term care.(7) Although published in 2020 the searches were undertaken in 2015 and 2017. This review focused on

assistance for communication where a person was living with a communication disorder. The review found a number of apps suitable for use in long-term care but concluded that apps would be improved by including research evidence and input from experienced nurses and healthcare aides in app development.

A wide-ranging integrative review of telemedicine and telehealth in nursing homes used systematic methods and had inclusion criteria which encompassed this question, but no relevant studies were included.(10) A 2021 systematic review looked at mHealth applications for older adults and considered features which were helpful for this population of app users.(8) We also identified a 2021 scoping review of apps for care workers working with older people.(11) This focused on care workers in palliative end-of-life care and included eight apps. The authors concluded that currently available care worker apps have limited functionality and scope in this setting and that there is opportunity for a co-designed care-worker app underpinned by robust evidence.

Because the identified evidence syntheses were not directly relevant we looked for primary research (RCTs in the first instance). We identified a highly relevant cluster-RCT which evaluated a falls prevention programme, Guide to Action for Care Homes (GtACH).(12-14) This included a decision support tool, staff training, a manual, a poster, an App and online training films. Eighty-four care homes were randomised to either the GtACH intervention or to usual care with 1657 residents providing consent. The rate of falls was statistically significantly lower at 90-180 days after randomisation in the intervention group (6.0/1000 resident days) than in the control group (10.4/1000 resident days) (RR adjusted for baseline rate 0.63; 95% CI 0.52 to 0.78). This finding was also present at 1-90 days post-randomisation but not at periods longer than 180 days (up to 360 days). Other outcomes showed no differences with the exception of lower proportion of residents experiencing fractures in the intervention group at 181-360 days post-randomisation. Cost-effectiveness analysis showed a 92% probability that the intervention was cost-effective at a threshold of £20,000/QALY based on EQ-5D calculations for QALY (an alternative measure produced a 57% probability at this threshold). Cost per fall averted was £191.

This was a well-conducted cluster-RCT which represents moderate certainty evidence that the intervention evaluated is probably effective. The authors identified reasons why their intervention was effective when evidence for other interventions was not conclusive.(15) They suggested that the process they used for co-design, piloting and feasibility trials enabled an intervention which was appropriate to the context and specific challenges of falls prevention in the care home setting. They identified the need for further implementation work to support consistent and sustainable implementation across variations in care home organisations.

3.1.3 Risk assessments and associated interventions and Interventions in residential care settings

Because of the overlapping guidance identified we present the updated evidence for these question elements together.

We identified a 2022 clinical practice guideline for fall prevention in residential settings and hospitals.(16) This was based on a systematic review of 79 RCTs which included a GRADE assessment of the certainty of the evidence, and a Delphi process. The guideline produced strong recommendations for: multifactorial interventions, professionally supported body exercise interventions, and education and counselling interventions. Not recommended were the use of a

specific assessment tool for fall risk assessment, low-floor beds in hospitals, or body exercise interventions in frail residents.

We previously identified 2013 NICE guidance which recommended multifactorial risk assessments for older people requiring medical attention for a fall, reporting recurrent falls or demonstrating abnormalities of gait and/or balance. (17) The recommendation states that the assessment should be performed by an appropriate healthcare professional, normally in the context of a specialist falls service and should form part of an individualised multifactorial intervention. This guidance is still current and is not limited to people living in residential care settings.

We also previously identified a Cochrane review from 2018 which considered interventions for preventing falls in older people in care facilities and hospitals.(15) This is still the most recent Cochrane review in this area. It found that evidence ranged from moderate to very low certainty for people in care facilities; but there was little or no difference in risk of falling for any intervention despite substantial numbers of participants. Vitamin D supplementation probably reduces the rate of falls.

3.2 RESTORE2-mini (Soft Signs) (question 2)

The previous version of this RES identified systematic reviews from 2015 and 2009 which looked at nurse recognition of signs for concern patients in general hospital wards.(18, 19) Worry and concern were found to occur with or without changes in vital signs. This was considered to be reliable but indirectly relevant evidence.

In this update we identified a scoping review of decision-support tools for early detection of infections in older people.(20) This included 17 papers of which five reported decision-support tools which had been developed in nursing or care homes. The review was limited to tools designed to detect signs of infection and, as a scoping review, did not assess the effectiveness of the tools or the quality of the included studies although it did report results where tools had been tested.

Only two tools targeted detection of non-specific infection. One of these was identified in the previous version of this RES;(21) the second has been indexed since then. This reports the development process of an algorithm for detecting urinary tract infections, respiratory tract infections and skin and soft tissue infections.(1) This was not assessed for effectiveness but the authors reported that “focus groups and interview participants could see the value in the algorithm, and staff often reported that it reflected their usual practice “. This tool was developed in the UK as an adaptation of a Canadian version of the algorithm.

Only two tools in nursing homes had outcome data for their implementation. Both focused on detection of UTI. One tool was assessed in an RCT and decreased the rate of urine culture testing and antimicrobial prescriptions ($P < 0.001$) without increases in hospital admissions or mortality. The second was assessed in an observational study and authors reported reduced chances of a prescription being issued for UTI where there was successful implementation (OR 0.35; 95% CI: 0.16 to 0.76). These tools targeted more clinical signs and are likely to be indirectly relevant.

We previously identified a number of primary observational studies which looked at detection of signs and symptoms in care home residents. Findings supported that identification of early signs of “not normal for this resident” was often predictive of subsequent illness.

4. References

1. Hughes C, Ellard DR, Campbell A, Potter R, Shaw C, Gardner E, et al. Developing evidence-based guidance for assessment of suspected infections in care home residents. BMC Geriatr. 2020;20(1):59.

2. Nelson PA, Bradley F, Ullah A, Whittaker W, Brunton L, Calovski V, et al. Implementation, uptake and use of a digital COVID-19 symptom tracker in English care homes in the coronavirus pandemic: a mixed-methods, multi-locality case study. Implementation Science Communications. 2023;In Press.

3. Ullah A, Whittaker W, Bradley F, Nelson PA, Dowding D, Morciano M, et al. The use and impact of digital COVID-19 tracking in adult social care: a prospective cohort study of care homes in Greater Manchester. BMC Infectious Diseases. 2023;In press.

4. Anthony Berauk VL, Murugiah MK, Soh YC, Chuan Sheng Y, Wong TW, Ming LC. Mobile health applications for caring of older people: review and comparison. Therapeutic Innovation and Regulatory Science. 2018;52(3):374-82.

5. Roeing KL, Hsieh KL, Sosnoff JJ. A systematic review of balance and fall risk assessments with mobile phone technology. Archives of Gerontology and Geriatrics. 2017;73:222-6.

6. Wild D, Kydd A, Szczepura A. Implementing digital skills training in care homes: a literature review. Nursing Older People 2016;28(4):26-9.

7. Wilson R, Cochrane D, Mihailidis A, Small J. Mobile Apps to Support Caregiver-Resident Communication in Long-Term Care: Systematic Search and Content Analysis. JMIR Aging. 2020;3(1):e17136.

8. Liu N, Yin J, Tan SS, Ngiam KY, Teo HH. Mobile health applications for older adults: a systematic review of interface and persuasive feature design. J Am Med Inform Assoc. 2021;28(11):2483-501.

9. de Oliveira FS, da Silva CC, Pinheiro TS, Yokoi LM, Dos Santos PD, Tanaka H, et al. Assessment of mHealth Solutions Applied to Fall Detection for the Elderly. Stud Health Technol Inform. 2021;285:239-44.

10. Groom LL, McCarthy MM, Stimpfel AW, Brody AA. Telemedicine and Telehealth in Nursing Homes: An Integrative Review. J Am Med Dir Assoc. 2021;22(9):1784-801.e7.

11. Vandersman P, Perimal-Lewis L, Tieman J. Is there an App for that? A scoping review of apps for care workers in the aged care sector. In: Maeder AJ, editor. Telehealth Innovations in Remote Healthcare Services Delivery: IOS Press; 2021.

12. Logan PA, Horne JC, Gladman JRF, Gordon AL, Sach T, Clark A, et al. Multifactorial falls

prevention programme compared with usual care in UK care homes for older people: multicentre cluster randomised controlled trial with economic evaluation. BMJ. 2021;375:e066991.

13. Logan P, McCartney K, Armstrong S, Clarke A, Conroy S, Darby J. Evaluation of the Guide to Action Care Home fall Prevention Programme in Care Homes for Older People: Protocol for a Multi-Centre, Single Blinded, Cluster Randomised Controlled Trial (FinCH). 2019.

14. Logan PA, Horne JC, Frances Allen F, Armstrong SJ, Clark AB, Conroy S, et al. A multidomain decision support tool to prevent falls in older people: the FinCH cluster RCT Health Technology Assessment. 2022;26(9).

15. Cameron ID, Dyer SM, Panagoda CE, Murray GR, Hill KD, Cumming RG, et al. Interventions for preventing falls in older people in care facilities and hospitals. Cochrane Database Syst Rev. 2018;9(9):Cd005465.

16. Schoberer D, Breimaier HE, Zuschnegg J, Findling T, Schaffer S, Archan T. Fall prevention in hospitals and nursing homes: Clinical practice guideline. Worldviews Evid Based Nurs. 2022;19(2):86-93.

17. NICE. Falls in older people: assessing risk and prevention. CG161. https://www.nice.org.uk/guidance/cg161/chapter/recommendations#multifactorial-intervention. Accessed January 2023; 2013.

18. Douw G, Schoonhoven L, Holwerda T, Huisman-de Waal G, van Zanten AR, van Achterberg T, et al. Nurses' worry or concern and early recognition of deteriorating patients on general wards in acute care hospitals: a systematic review. Crit Care. 2015;19(1):230.

19. Odell M, Victor C, Oliver D. Nurses' role in detecting deterioration in ward patients: systematic literature review. Journal of Advanced Nursing. 2009;65(10):1992-2006.

20. Masot O, Cox A, Mold F, Sund-Levander M, Tingström P, Boersema GC, et al. Decision support-tools for early detection of infection in older people (aged> 65 years): a scoping review. BMC Geriatrics. 2022;22(1):552.

21. Tingström P, Milberg A, Rodhe N, Ernerud J, Grodzinsky E, Sund-Levander M. Nursing assistants: "he seems to be ill" - a reason for nurses to take action: validation of the Early Detection Scale of Infection (EDIS). BMC Geriatr. 2015;15:122.

For more information, please contact

Michael Spence
michael.spence@manchester.ac.uk

Produced by the NIHR Applied Research Collaboration Greater Manchester January 2023.

The information in this report is correct at the time of printing.