Reducing unplanned hospital admissions from care homes: a systematic review

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Scientific summary

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Background

Residents of care homes for older people often have complex health and care needs driven by frailty and dementia and are at high risk of experiencing unplanned hospital admissions. While such admissions may be appropriate, they can be distressing for residents, their families, friends, and care home staff. They can also be costly for the NHS. Unplanned care home admissions may be avoidable if they arise from conditions that can be managed outside the hospital or are triggered by how care is organised in the community.

Interventions to reduce unplanned admissions may be implemented at various points in the health and social care system. In 2014, the University of York Centre for Reviews and Dissemination (CRD) published an evidence briefing on the topic for health service commissioners. They categorised interventions under the headings of community geriatrician services, case management, discharge planning, integrated working between primary care and care homes, medicines management, the prevention of delirium and end-of-life care. The review was based predominantly on systematic reviews and the key finding was that 'there is little good quality comparative evidence to inform strategies for reducing unplanned admissions from care homes'. The authors noted, however, that closer working between healthcare and care home staff, training for care home staff and advance care planning at the end of life all showed promise.

This topic was commissioned by the National Institute for Health and Care Research Health and Social Care Delivery Research Programme in 2020 and the need for an update to the CRD review is justified by the substantial volume of new research since 2014. This review updates and extends the CRD review published in 2014.

Objectives/research questions

The review addresses the following five research questions:

1. What interventions are used in the UK health and social care system to minimise unplanned hospital admissions of care home residents?
2. What candidate interventions, used in other applicable settings, could potentially be used in the UK?
3. What can we learn from research studies and 'real-world' evaluations about the effects of such interventions on admissions?
4. What is known about the feasibility of implementing such interventions in routine practice and their acceptability to care home residents, their families and staff?
5. What is known about the costs and value for money associated with these interventions?

Methods

A broad search for evidence was conducted in December 2021 to identify published and peer-reviewed literature on interventions to reduce unplanned admissions from care homes in the UK and other high-income countries. The search strategy was initially developed on MEDLINE and included thesaurus and free-text terms and relevant synonyms for the population (residents in care homes for older people) and intervention (interventions to reduce unplanned admissions). The search was limited to research

published in English from 2014 to December 2021 to reflect developments since the previous review. The National Institute for Health and Care Excellence filter for Organisation for Economic Co-operation and Development countries was used to aid retrieval of studies from UK and other high-income countries.

Searches were conducted on the following databases:

- Cochrane Central Register of Controlled Trials and Cochrane Database of Systematic Reviews
- Cumulative Index to Nursing and Allied Health Literature
- EMBASE
- Health Management Information Consortium
- MEDLINE
- PsycINFO® (American Psychological Association, Washington, DC, USA)
- Science and Social Sciences Citation Indexes
- Social Care Online
- Social Service Abstracts.

Targeted 'grey' literature searches were also conducted to identify reports, guidelines and policy in January 2022. Reference checking of all included studies was undertaken and citation searches of the initial included studies.

Search results were downloaded to a bibliographic management database (EndNote X9; Clarivate Analytics, Philadelphia, PA, USA) for deduplication and then exported to EPPI-Reviewer Web (EPPI Centre, University College London, London, UK) for coding and analysis.

Inclusion criteria for the review were as follows:

- **Population**: Residents of care homes for older people with and without nursing.
- **Intervention**: Interventions delivered in care homes or hospitals to reduce unplanned admissions. A taxonomy of interventions was developed to classify the interventions which includes quality improvement (QI) programmes, integrated care, training/workforce development, palliative/end-of-life care, advance care planning (ACP), management of specific problems, emergency department interventions, paramedic assessment/non-conveyance and other.
- **Outcomes**: Primary outcomes were measures of impact on unplanned admissions among care home residents; barriers/facilitators to implementation in a UK setting and acceptability to care home residents, their families and staff involved in delivering the intervention.
- **Setting**: The setting of interest is the UK social care and health system. Studies from other high-income countries (as defined by the World Bank) were included but synthesised separately and assessed for relevance to the UK context.
- **Comparator**: Studies will ideally compare an intervention with an alternative (such as continuing current practice) using an experimental or quasi-experimental design. Before/after studies with or without a control setting and non-comparative qualitative or mixed methods studies were also included.
- **Study design**: We included any study design that provided data on the outcomes of interest. We also included systematic literature reviews, but in view of the volume of primary literature retrieved, these were used for reference checking only.

Study selection was undertaken in stages:

1. Keyword searching of EPPI-Reviewer for relevant terms in title and abstract was used as a preliminary filter to reduce the large number of records retrieved to a more manageable set.
2. A single reviewer excluded records with relevant terms that were clearly not relevant based on the title.

3. Remaining records, titles and abstracts were screened independently by two reviewers.
4. Full-text items that potentially met the inclusion criteria were obtained and evaluated by two reviewers independently with discrepancies resolved by consensus or referral to a third reviewer.

Data from included studies were extracted into EPPI-Reviewer using a customised set of codes that covered the study characteristics, key findings/conclusions and strengths/limitations. The Template for Intervention Description and Replication checklist was used to extract data on intervention components and delivery. The Promoting Action on Research Implementation in Health Services framework was used to support extraction of relevant data on implementation of interventions from included UK studies and the Framework for Intervention Transferability Applicability Reporting) tools was used to assess applicability of international evidence to the UK context. Risk of bias for studies using recognised research designs was assessment using the following tools:

- Joanna Briggs Institute checklists for randomised controlled trials and quasi-experimental studies.
- National Heart, Lung and Blood Institute checklist for cohort and cross-sectional studies.
- Mixed Methods Appraisal Tool for mixed methods and qualitative studies.

Assessments were performed by two reviewers independently, with discrepancies resolved by consensus or referral to a third reviewer.

The review evidence was synthesised narratively. Studies were grouped by type of intervention, using the taxonomy, and setting (UK or international) and the study characteristics, findings and study quality for each group were summarised with any general issues about implementation or applicability to the UK setting. The overall strength of evidence for intervention effectiveness was classified as 'stronger', 'weaker', 'very limited' or 'inconsistent'. To help decision-makers to form an overall assessment of the value of an intervention, feasibility, applicability and 'cost-effectiveness' were considered alongside the evidence on effectiveness. The analysis of the overall strength of the evidence includes all studies included in the review, no studies were excluded based on study design or risk of bias. The main report includes evidence summary tables and detailed tables on intervention characteristics, implementation and applicability and risk of bias tables for different study designs are provided in the appendices.

Public involvement

Patient and public involvement was an integral part of this review process. A public co-applicant led on public involvement with the support of regular meetings of a public advisory group convened for this review. The review team met with the public advisory group at the start of the project, to discuss emerging findings, for further discussion of review findings and a final meeting focusing on dissemination of the review findings and to discuss their potential involvement in the final report including the plain English and reporting on the public involvement.

Results

The database search retrieved 16,845 unique references after deduplication. Searches on EPPI-Reviewer were conducted to prioritise references for screening. Screening of the titles of 6141 references by a single reviewer was followed by screening of abstracts of 576 references by two reviewers and full-text screening of 234 potentially relevant records by two reviewers. The citation search and items from the 'grey' literature searches were also screened.

The review included 124 studies, of which 30 were from the UK, 44 from the USA, 24 from Australia, 4 from New Zealand, 20 from other countries and 2 from multiple countries. Integrated working was the

most common type of intervention in the UK and Australia and QI programmes were particularly common in the USA.

The review found that integrated care and QI programmes providing additional support to care homes (e.g. the English Care Homes Vanguard initiatives and hospital-based services in Australia) appeared to reduce unplanned admissions relative to usual care. Effective interventions often involved different staff groups, frequently organised in multidisciplinary teams. Simpler training and staff development initiatives showed mixed results, as did interventions aimed at tackling specific problems (e.g. medication review).

Advance care planning was key to the success of most QI programmes included in the review but 'do not hospitalise' orders were problematic. Qualitative research identified tensions affecting decision-making involving paramedics, care home staff and residents/family carers. The best way to reduce end-of-life admissions through access to palliative care was unclear in the face of inconsistent and generally low-quality evidence.

Common barriers to implementation of interventions were high staff turnover, competing pressures on staff time and failure to secure support from care home managers for proposed interventions. Common factors that facilitated successful implementation of interventions were having champions within care homes, funding for implementation of initiatives and a policy environment that prioritises reducing unplanned admissions.

We identified a wide range of issues that could affect applicability of international evidence. Examples included mixtures of long-stay and short-stay residents in some nursing homes (USA), cultural attitudes to advanced care planning/palliative care (USA/Europe), workforce regulations and roles of different grades, especially nurses (United States USA/Australia) and public ownership of care homes (the Netherlands/Denmark). Evidence also showed that the cohorts of residents living in care homes are very similar around the globe, suggesting that it is possible to transfer approaches between countries so long as new models from overseas are evaluated in parallel with implementation when introduced for the first time.

A total of 11 UK and 14 international studies provided some data on costs or 'value for money'. Most of these studies were not designed as full economic evaluations, meaning that not all relevant costs and benefits may have been taken into account. The majority of studies reported cost savings, but weak study designs and limited reporting meant that findings should be interpreted with caution.

Conclusions

Implications for service delivery

- Opportunities to reduce unplanned admissions exist at all stages of residents' care journeys from routine care to palliative care at the end of life.
- Types of intervention such as QI programmes or integrated working between care homes and primary care/community services differ in workforce requirements, technology, intensity of the intervention etc. Services can consider adapting described interventions to their own context, including possibilities for simplification.
- Evidence suggests that care home managers and staff support proposed interventions that will help them to deliver better care for their residents. Early and genuine consultation to assess feasibility and acceptability of interventions could be a major factor in successfully implementing new service models.
- Specific work is required to build relationships between NHS and care home providers and staff at a local and regional level.

- There is some evidence to guide where changes to services are more likely to improve outcomes; for example, care homes without nurses may benefit more than those with nurses from some forms of support because of their lower baseline level of staffing and because of differences in case mix.
- In attempting to transfer approaches between countries, attention should be paid to the differences and similarities between systems, and new models from overseas should be evaluated in parallel with implementation in the UK setting.
- Work is needed to better understand and standardise operating procedures between care homes and ambulance providers seeking to negotiate care for residents during medical crises, particularly with regard to lines of responsibility and shared liability for decision-making.

Recommendations for research

We have identified the following priorities for research:

1. Researchers should carefully consider what is realistic in terms of study design and data collection given the current UK context of extreme pressure on care homes. As with changes to service delivery, genuine involvement of care home residents, family members and staff is required to design and deliver high-quality research. Development and reporting of appropriate patient-reported outcome measures is recommended.
2. Research is needed to understand better the factors that enable effective interventions to become embedded and sustained in practice over the long term.
3. There is a need for rigorous economic evaluations, ideally using measures that can be used to compare different interventions and taking into account costs associated with implementation, particularly how costs are transferred between health and social care commissioners and providers.
4. The national roll-out in England of Hospital at Home, as part of the Frailty Virtual Wards initiative, alongside Urgent Community Response, provides an opportunity to evaluate the applicability of approaches evidenced to work in Australia and in the UK setting.
5. Further research is required to evaluate approaches based on paramedic assessment and potential non-conveyance, including assessment of safety and qualitative studies of resident, family carer and care home staff/management perspectives.
6. Further research is required to better understand the role of telehealth in reducing unplanned admissions of residents with cognitive or sensory impairments.
7. Research to evaluate interventions to reduce unplanned admissions from assisted living settings in the UK is required, bearing in mind the lower levels of both resident need and on-site services.

Study registration

This study is registered as PROSPERO CRD42021289418. The full protocol can be accessed via https://fundingawards.nihr.ac.uk/award/NIHR133884 (accessed 9 January 2023).

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