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Abstract

Community-based complex interventions to sustain independence in older people, stratified by frailty: a systematic review and network meta-analysis

Thomas Frederick Crocker,[1] Natalie Lam,[1] Joie Ensor,[2] Magda Jordão,[1] Ram Bajpai,[2] Matthew Bond,[2] Anne Forster,[1] Richard D Riley,[2] Deirdre Andre,[3] Caroline Brundle,[1] Alison Ellwood,[1] John Green,[1] Matthew Hale,[1] Jessica Morgan,[4] Eleftheria Patetsini,[1] Matthew Prescott,[1] Ridha Ramiz,[1] Oliver Todd,[1] Rebecca Walford,[4] John Gladman[5] and Andrew Clegg[1*]

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Background: Sustaining independence is important for older people, but there is insufficient guidance about which community health and care services to implement.

Objectives: To synthesise evidence of the effectiveness of community services to sustain independence for older people grouped according to their intervention components, and to examine if frailty moderates the effect.

Review design: Systematic review and network meta-analysis.

Eligibility criteria: Studies: Randomised controlled trials or cluster-randomised controlled trials.

Participants: Older people (mean age 65+) living at home.

Interventions: community-based complex interventions for sustaining independence.

Comparators: usual care, placebo or another complex intervention.

Main outcomes: Living at home, instrumental activities of daily living, personal activities of daily living, care-home placement and service/economic outcomes at 1 year.

Data sources: We searched MEDLINE (1946–), Embase (1947–), CINAHL (1972–), PsycINFO (1806–), CENTRAL and trial registries from inception to August 2021, without restrictions, and scanned reference lists.

Review methods: Interventions were coded, summarised and grouped. Study populations were classified by frailty.

A random-effects network meta-analysis was used. We assessed trial-result risk of bias (Cochrane RoB 2), network meta-analysis inconsistency and certainty of evidence (Grading of Recommendations Assessment, Development and Evaluation for network meta-analysis).

Results: We included 129 studies (74,946 participants). Nineteen intervention components, including 'multifactorial-action' (multidomain assessment and management/individualised care planning), were identified in 63 combinations.

The following results were of low certainty unless otherwise stated.

For living at home, compared to no intervention/placebo, evidence favoured:

- multifactorial-action and review with medication-review (odds ratio 1.22, 95% confidence interval 0.93 to 1.59; moderate certainty)
- multifactorial-action with medication-review (odds ratio 2.55, 95% confidence interval 0.61 to 10.60)
- cognitive training, medication-review, nutrition and exercise (odds ratio 1.93, 95% confidence interval 0.79 to 4.77) and
- activities of daily living training, nutrition and exercise (odds ratio 1.79, 95% confidence interval 0.67 to 4.76).

Four intervention combinations may reduce living at home.

For instrumental activities of daily living, evidence favoured multifactorial-action and review with medication-review (standardised mean difference 0.11, 95% confidence interval 0.00 to 0.21; moderate certainty). Two interventions may reduce instrumental activities of daily living.

For personal activities of daily living, evidence favoured exercise, multifactorial-action and review with medication-review and self-management (standardised mean difference 0.16, 95% confidence interval −0.51 to 0.82). For homecare recipients, evidence favoured the addition of multifactorial-action and review with medication-review (standardised mean difference 0.60, 95% confidence interval 0.32 to 0.88).

Care-home placement and service/economic findings were inconclusive.

Limitations: High risk of bias in most results and imprecise estimates meant that most evidence was low or very low certainty. Few studies contributed to each comparison, impeding evaluation of inconsistency and frailty. Studies were diverse; findings may not apply to all contexts.

Conclusions: Findings for the many intervention combinations evaluated were largely small and uncertain. However, the combinations most likely to sustain independence include multifactorial-action, medication-review and ongoing review of patients. Some combinations may reduce independence.

Future work: Further research is required to explore mechanisms of action and interaction with context. Different methods for evidence synthesis may illuminate further.

Study registration: This study is registered as PROSPERO CRD42019162195.

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Supplementary material can be found on the NIHR Journals Library report page (https://doi.org/10.3310/HNRP2514).

Supplementary material has been provided by the authors to support the report and any files provided at submission will have been seen by peer reviewers, but not extensively reviewed. Any supplementary material provided at a later stage in the process may not have been peer reviewed.

List of abbreviations

ac	available care
ADL	activities of daily living
ASPIRE	Assessment of Services Promoting Independence and Recovery in Elders
CAPABLE	Community Aging in Place – Advancing Better Living for Elders
CI	confidence interval
CINeMA	Confidence in Network Meta-Analysis
cRCT	cluster-randomised controlled trial
FOG	Frailty Oversight Group
GRADE	Grading of Recommendations Assessment, Development and Evaluation
IADL	instrumental activities of daily living
IQR	interquartile range
MD	mean difference
NMA	network meta-analysis
NNTB	number needed to treat to benefit
OR	odds ratio
PADL	personal activities of daily living
PMG	Project Management Group
PPI	patient and public involvement
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analyses
PRO-AGE	PRevention in Older people – Assessment in GEneralists' practices
QALY	quality-adjusted life-year
RCT	randomised controlled trial
REML	restricted maximum likelihood
RoB	risk of bias
RR	risk ratio
SD	standard deviation
SMD	standardised mean difference
SUCRA	Surface Under the Cumulative RAnking curve
TIDieR	Template for Intervention Description and Replication

Plain language summary

Which community services are best for helping older people to be independent?

Key messages

- Due to a lack of robust evidence, the benefits and risks of most types of community services for older people are unclear.
- Individualised care planning, where medication is adjusted and there are regular follow-ups, probably helps people stay living at home.

What are community services for older people?

There are many kinds of community services for older people. For example, in some services, everyone is given exercise and dietary advice or an individualised care plan. These often aim to help older people age independently.

What was the study about?

Maintaining independence is important in later life.

We wanted to find out which community services work best:

- to help people stay living at home, and
- to do day-to-day activities independently.

We reviewed findings from previous studies that have tested different community services for older people. We combined these findings and compared different types of service with one another. We rated our confidence in the evidence.

What did we find?

We found 129 studies with 74,946 people. We found 63 different kinds of service have been studied. The studies were carried out in diverse populations around the world.

Individualised care planning, where medication is adjusted and there are regular follow-ups, may help people age independently. It probably increases the chance of staying at home slightly. It may also help with doing day-to-day activities very slightly.

Exercise and dietary advice may also help people stay living at home.

However, there was some evidence that some services may reduce independence.

We do not know what effect most services have.

What are the limitations of the evidence?

We generally had little confidence in the evidence because studies were small, and information was missing.

How current is the evidence?

The evidence is up to date to August 2021.

Scientific summary

Background

The number and proportion of older people are growing in the UK and worldwide. Maintaining independence is a goal of community health and care services for older people. The concept of frailty can be used to distinguish between people who remain in robust health in later life and those who are at greater risk of losing independence and needing care. Previous research has suggested that community-based complex interventions are generally effective for supporting independence for older people, but only broad service models have been explored. There is insufficient guidance about which services to implement and the appropriateness of different services for different levels of frailty. We aimed to provide a rigorous, contemporary synthesis of trial evidence to identify how interventions might best be configured to improve outcomes for older people, and inform the commissioning and delivery of evidence-based services.

Objectives (list of research questions)

1. Do community-based complex interventions to sustain independence in older people increase living at home, independence and health-related quality of life?
2. Do community-based complex interventions to sustain independence in older people reduce home-care usage, depression, loneliness, falls, hospitalisation, care-home placement, costs and mortality?
3. How should interventions be grouped for network meta-analysis (NMA)?
4. What is the optimal configuration of community-based complex interventions to sustain independence in older people?
5. Do intervention effects differ by a population's frailty level (robust; pre-frailty; frailty)?

Methods

Systematic review with NMA of trials evaluating community-based complex interventions to sustain independence in older people (mean age 65 years and over), compared with usual care or another complex intervention meeting our criteria, with follow-up for at least 24 weeks. We followed Cochrane methods, Grading of Recommendations Assessment, Development and Evaluation (GRADE) and Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) NMA guidance.

Information sources

We searched the following databases and trial registers from inception between 9 and 11 August 2021: Cochrane Central Register of Controlled Trials (CENTRAL) Wiley (1992–); MEDLINE Ovid (1946–); Embase and Embase Classic Ovid (1947–); CINAHL EBSCOhost (1972–); APA PsycINFO Ovid (1806–); US National Institutes of Health Ongoing Trials Register, ClinicalTrials.gov (www.clinicaltrials.gov); World Health Organization, International Clinical Trials Registry Platform (https://trialsearch.who.int). We scanned the reference lists of included studies.

Study selection

Eligibility criteria

- Randomised controlled trials (RCTs) or cluster-RCTs.

- Participants were older people living at home (mean age 65 years or older). Participants living in residential/nursing homes were excluded.
- With an intervention that:
  - was both initiated and mainly provided in the community
  - included two or more interacting components (intervention practices, structural elements and contextual factors)
  - was targeted at the individual person, with provision of appropriate specialist care
  - focused on sustaining (maintaining or improving) the person's independence.
- Usual care, 'placebo' or attention control or a different complex intervention which met our criteria were eligible comparators.
- Outcome data were measured at a minimum 24 weeks (approximately 6 months) time point.

Study selection process

Two researchers independently evaluated eligibility of records (title and abstract) and reports (full text). Disagreements were resolved by consensus.

Data collection process

Two researchers independently collected data.

Main outcomes

- Living at home.
- Activities of daily living (ADL): personal ADL (PADL)/instrumental ADL (IADL).
- Hospitalisation.
- Care-home placement.
- Homecare services (non-healthcare professional) usage.
- Costs.
- Cost-effectiveness.

Additional outcomes

- Health status/health-related quality of life.
- Depression.
- Loneliness.
- Falls.
- Mortality.

Data were extracted (including treatment effect estimates) and categorised into three time frames:

- short term (around 6 months): 24 weeks to 9 months
- medium term (around 12 months): > 9 months to 18 months
- long term (around 24 months): > 18 months

with the medium term as our main time frame.

Intervention grouping

We grouped all eligible interventions (including comparators) in preparation for NMA in a three-stage process of coding and summarising based on the Template for Intervention Description and Replication framework, categorisation and grouping.

Assessment of frailty
Two reviewers with extensive clinical academic frailty expertise (AC and JG) independently categorised study level frailty (robust, pre-frailty, frailty) based on validated measures where available or participant characteristics and study inclusion criteria using the phenotype model as a framework.

Risk-of-bias assessment
Two reviewers independently assessed risk of bias (RoB) in each result of interest from each included study, using the Revised Cochrane risk-of-bias tool for randomised trials (RoB 2).

Data synthesis
Meta-analysis was conducted for living at home, PADL, IADL and care-home placement for each of the three time frames separately, and for hospitalisation, health status and depression in the medium term only. Other outcomes were narratively synthesised.

Meta-analysis
We meta-analysed the extracted effect estimates using modules within Stata. Random-effects meta-analyses were conducted.

Initially, for each outcome and time frame, we performed a separate meta-analysis for each type of intervention versus control, to provide summary effectiveness results based only on direct evidence.

An NMA was then conducted (for each outcome and time frame separately) using a multivariate random-effects meta-analysis framework via the network module in Stata using restricted maximum likelihood estimation. We produced summary (pooled) effect estimates for each pair of treatments in the network, with 95% confidence intervals (CIs). Based on the results, the ranking of intervention groups was calculated using resampling methods.

The consistency assumption (that direct and indirect evidence are consistent with each other) was examined for each treatment comparison where possible and across the whole network.

The effect of study-level frailty on each intervention group effect was examined where data allowed. Sensitivity analyses were conducted excluding results at the highest RoB, and funnel plots examined for small-study effects.

Confidence in cumulative evidence
We used the GRADE framework, adapted for NMA, to rate the certainty of the results of our NMA.

Summary of economic evidence
We followed the brief economic commentary framework to summarise, compare and contrast the principal findings from the included studies.

Results

We screened 40,112 records and assessed 973 reports for eligibility. We included 129 studies consisting of 496 reports.

The studies assigned 74,946 participants (three studies missing data) to 266 eligible intervention arms. They were predominantly conducted in developed countries and most participants were described as white. Nonetheless, the overall population included a broad range of demographic characteristics. Study populations included all frailty levels.

We identified 19 separate components of included interventions which were evaluated in 63 combinations including the absence of all of these components, which we termed available care (ac), and homecare (a common control group in populations where all participants were receiving homecare). Homecare involved frequent visits at home by professionals who typically supported domestic and self-care tasks. Five components were primarily about a process of ascertainment or assessment and planning with subsequent action: **multifactorial-action** from care planning (a process of individualised multidomain assessment and management) with or without routine **review** (scheduled, regular follow-ups), **medication-review**, **monitoring** and routine **risk-screening**. The 14 other components and their short labels (bold) were **ADL** training, providing **aids** and adaptations, **alternative medicine**, **care voucher** provision, **cognitive training**, health **education**, physical **exercise**, formal **homecare**, engagement in **meaningful-activities**, **nutrition**al support, psychological (mood) therapy (**psychology**), **social skills** training, technology for communication and engagement (**telecoms**), **welfare** rights advice. Multifactorial-action was further delineated based on the presence or absence of an embedded medication-review and specific self-management strategies.

We judged most results to be at high RoB, primarily due to missing outcome data. This led to serious concerns with RoB for many of the GRADE ratings of evidence.

Findings

Most networks were small and sparse, with few included studies contributing to most networks. We found little evidence of inconsistency but there was usually low power to detect this. All outcomes except mortality needed to be analysed in two separate NMAs as the networks were disconnected: one with ac as the reference comparator ('available-care network') and one with homecare as the reference comparator ('homecare network'). Estimates are reported here only in comparison with the reference comparator. Comparisons with ac can be thought of as the effect of adding the intervention for a population who are not all receiving any particular care; comparisons with homecare are similarly an alternative intervention for a population already in receipt of homecare without associated reablement or multifactorial-action from care planning. Most estimates were low certainty or very low certainty due to RoB, imprecision or their combination, and we do not describe very low-certainty evidence below.

Living at home

For living at home in the medium term there were 21 studies (*n* = 16,937) with 14 intervention groups in the available-care network. There was moderate-certainty evidence that multifactorial-action and review with medication-review probably results in a slight increase in the chance of living at home [odds ratio (OR) 1.22, 95% CI 0.93 to 1.59; moderate certainty]. There was low-certainty evidence that multifactorial-action with medication-review [OR 2.55 (large), 95% CI 0.61 to 10.60]; cognitive training, medication-review, nutrition and exercise [OR 1.93 (large), 95% CI 0.79 to 4.77]; and ADL, nutrition and exercise [OR 1.79 (large), 95% CI 0.67 to 4.76] may result in an increase in the chance of living at home, and that risk-screening; education, multifactorial-action and review with medication-review; and education, multifactorial-action and review with medication-review and self-management may each result in some reduction in chance of living at home. Other comparisons with ac were of very low certainty.

In the short- and long-term time frames, results were at best low certainty. For multifactorial-action and review with medication-review; and ADL, nutrition and exercise, estimates were similarly of small increases in the long term but of little to no difference in the short term. There were similar results in other time frames for education, multifactorial-action and review with medication-review and self-management; and risk-screening, but contrasting evidence of reduction followed by an increase in living at home for education, multifactorial-action and review with medication-review.

The homecare network for living at home was smaller (five studies, *n* = 1978 in the medium term). In the short- and medium-term time frames, there was low-certainty evidence that homecare, ADL,

multifactorial-action and review with self-management may result in a moderate or large reduction in the chance of living at home compared with homecare alone.

Instrumental activities of daily living

For the medium-term instrumental activities of daily living (IADL) available-care network there were 16 studies (*n* = 5309) with 14 intervention groups. Multifactorial-action and review with medication-review was associated with very slightly increased independence in IADL versus ac [standardised mean difference (SMD) 0.11, 95% CI 0.00 to 0.21; moderate-certainty evidence]. Two intervention groups may result in some reduction in IADL: ADL, aids and exercise; and ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management.

There were contrasting findings for multifactorial-action and review with medication-review in the long term, with moderate-certainty evidence of a very slight reduction in IADL (SMD −0.08, 95% CI −0.21 to 0.05).

For the homecare network, there was one low certainty finding in the short-term time frame of little to no difference for homecare, ADL, multifactorial-action and review with self-management with all other estimates being very low certainty.

Personal activities of daily living

For personal activities of daily living (PADL), 20 trials (*n* = 8583 participants) with 16 intervention groups contributed to the medium-term available-care network. One comparison was judged low certainty. Exercise, multifactorial-action and review with medication-review and self-management may result in a very slight increase in PADL (SMD 0.16, 95% CI −0.51 to 0.82).

The homecare network included four trials (*n* = 632 participants) in the medium term. As for ac, only one comparison with homecare was low certainty: homecare, multifactorial-action and review with medication-review may result in an increase in PADL [SMD 0.60 (moderate), 95% CI 0.32 to 0.88].

Other outcomes

For the service outcome of hospitalisation, there were low-certainty estimates of some reductions for education, exercise, multifactorial-action and review with medication-review and self-management; and education, multifactorial-action and review with medication-review; and of an increase for exercise, multifactorial-action and review with medication-review and self-management. For care-home placement, all estimates were rated very low certainty in the medium term. There was some evidence of both increases and decreases in use of homecare services with little pattern (not meta-analysed).

For our additional outcomes, there was little evidence of any effect on self-reported health status, only low certainty beneficial findings regarding depression, very little evidence regarding loneliness and more complex interventions were associated with less falling than more falling (12 studies vs. 4 studies). For mortality, there was a large network of 65 studies (*n* = 38,351) and 41 intervention groups. There was low-certainty evidence of reductions for two, and increases for five, intervention groups.

The summary of economic evidence included 39 studies. Based on the conclusions of 22 studies that performed a full economic evaluation, five intervention groups appeared promising compared with a standard intervention or ac from an economic perspective: ADL (medium-term time horizon); homecare, multifactorial-action and review with medication-review and self-management (short-term time horizon); meaningful-activities and education (short- and medium-term time horizon); multifactorial-action and review with medication-review (short- but not medium- or long-term time horizon); and exercise and multifactorial-action with medication-review (long-term time horizon).

Summary across outcomes

We found evidence that multifactorial-action and review with medication-review probably improves some important outcomes slightly (living at home, IADL), but there was also contradictory evidence for IADL in the long term. For some other intervention groups there was low-certainty evidence that they may improve or worsen particular outcomes but for most intervention groups evidence was either absent or very uncertain.

Conclusions

Available evidence suggests the community-based complex interventions most likely to sustain independence in older people involve multifactorial-action from multidomain assessment and individualised care planning, routine review and the incorporation of medication-review. There was also some positive evidence for the combination of exercise and nutritional support and multiple other intervention combinations. Decision-makers should be aware that there is plausible evidence that some community-based complex interventions may worsen outcomes such as living at home and ADL independence and that all of these findings are tentative.

We recommend the uncertainty in these findings be addressed by:

1. realist synthesis to explore the mechanisms and broader contextual factors relating to individual benefit or harm
2. future robust, large-scale trials which compare alternative interventions with multifactorial-action and review with medication-review
3. future Individual Participant Data meta-analysis (IPDMA) focusing on interventions with multifactorial action to explore factors relating to individual benefit or harm
4. greater reporting of the organisational aspects of intervention implementation in complex intervention research.

Study registration

This study is registered as PROSPERO CRD42019162195.

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Chapter 1 Background

There were 12.5 million people aged over 65 years in the UK in 2021 (19% of the population), and this number is expected to rise to 15 million (22%) over the following decade.[1,2] Similar growth is expected in most other developed countries, and more rapid population changes are anticipated in developing countries. In response to such demographic changes, policies and initiatives such as the World Health Organization's Decade of Healthy Ageing emphasise healthy ageing – aiming to increase the number of years lived in good health and to optimise independence and quality of life in the presence of accumulating health conditions.[3,4] The concept of frailty can be used to distinguish between people who have remained in robust health, and those who have accumulated multiple long-term conditions, are at risk of losing independence and are likely to require health and social care resources.[5] In the UK, around 10% of people aged 65 years and over have frailty, rising to around 50% of people aged over 85 years[6] and the additional annual cost to the healthcare system per person (in 2013–4) was approximately £550 for mild, £1200 for moderate and £2100 for severe frailty. This equates to a total additional financial cost of £5.6 billion per year across the UK.[7]

Health, social care and third-sector organisations provide community services to support healthy ageing. A systematic review and meta-analysis summarised evidence from 89 randomised controlled trials (RCTs) of complex interventions, published up to January 2005 and involving 97,984 participants, aiming to improve physical function and increase independence for community-dwelling older people.[8] The review reported that, in general, complex interventions provided in the community are effective in improving physical function and increasing independence in older people. While this result was encouraging, the review was unable to provide evidence to indicate which of the different service models or intervention components delivered within them were more effective. The review showed that services directed at older people after hospital discharge were significantly effective. It also showed that general untargeted services for older people were also significantly effective, whereas those targeted at older people with frailty were not. However, only one, ill-defined, service model (comprehensive geriatric assessment) was included in this subanalysis, and frailty was not operationalised using valid measurements. Policy-makers, commissioners and service providers require further information about the evidence of effectiveness of services and their components, and the effect that frailty has upon their effectiveness, to guide their decisions about exactly which complex community services for older people to commission and how they should be organised.

We have conducted such an evidence synthesis to update and expand the previous review. This updated meta-analysis includes additional studies of community-based services aiming to sustain the independence of older people in the community published since January 2005. By including information about the nature of the intervention components and the use of network meta-analysis (NMA), this updated review aimed to identify the most effective combinations of components or clusters of interventions. NMA extends traditional pairwise meta-analysis by incorporating evidence regarding the differential effects of multiple types of intervention. The review includes a formal evaluation of certainty in the available evidence. The impact of frailty has been examined in a meta regression analysis. Given the lack of a widely used taxonomy or classification of services or their components, this review has generated and applied a method to distinguish between intervention components and clusters of them.

Research questions and objectives

Research questions

1. Do community-based complex interventions to sustain independence in older people increase living at home, independence and health-related quality of life?

2. Do community-based complex interventions to sustain independence in older people reduce home-care usage, depression, loneliness, falls, hospitalisation, care-home placement, costs and mortality?
3. How should interventions be grouped for NMA?
4. What is the optimal configuration of community-based complex interventions to sustain independence in older people?
5. Do intervention effects differ by frailty level (robust, pre-frailty and frailty)?

Objectives

1. To identify RCTs and cluster RCTs (cRCTs) of community-based complex interventions to sustain independence in older people.
2. To synthesise evidence of their effectiveness for key outcomes (meta-analysis of study-level data).
3. To identify key intervention components and study-level frailty to inform groupings for NMA and meta regression.
4. To compare effectiveness of different intervention configurations (NMA).
5. To investigate the impact of frailty and pre-frailty (meta regression).

Chapter 2 Review methods

Design

Systematic review with NMA of trials evaluating community-based complex interventions to sustain independence in older people (mean age 65 years and over), compared with usual care or another complex intervention meeting our criteria, with follow-up for at least 24 weeks. We followed Cochrane methods,[9] evaluated quality of evidence following Grading of Recommendations Assessment, Development and Evaluation (GRADE) NMA guidance[10] and reported the review in accordance with preferred reporting items for systematic reviews and meta-analyses (PRISMA) 2020 and PRISMA NMA guidelines.[11] We prospectively registered the review on PROSPERO (CRD42019162195)[12] and the protocol was published before analysis began.[13]

Throughout the review we used monthly Project Management Group (PMG) meetings and the quarterly meetings of our established patient and public involvement (PPI) Frailty Oversight Group (FOG) to assure the relevance and appropriateness of day-to-day decisions and resolve disagreements between independent reviewers.

Health technologies being assessed

This review assessed community-based complex interventions for older people that were targeted at the individual and focused on sustaining their independence.

Complex interventions have been defined as interventions with several interacting components (intervention practices, structural elements and contextual factors).[14] They typically attempt to introduce new, or modify existing, patterns of collective action in healthcare or formal organisational settings, with an intention to lead to changed outcomes.[15] We used this definition of complex interventions to inform our eligibility criteria.

For this review, we defined sustaining independence to mean maintaining or improving independence in activities of daily living (washing, dressing, grooming, toileting, walking, preparing meals, doing housework, managing finances, assisting others, etc.), but not only one of these specific activities (e.g. walking only). This was a refinement made during the screening stage of our review, to ensure studies addressed this individually meaningful aim that is less interdependent on the wider healthcare context than other meanings (e.g. care home placement), and therefore more generalisable across trials.

Identification of studies

Information sources

Databases and trial registers

We searched the following databases from inception between 9 and 11 August 2021:

- Cochrane Central Register of Controlled Trials (CENTRAL) Wiley (1992 to 11 August 2021)
- MEDLINE Ovid (1946 to 6 August 2021)
- Embase and Embase Classic Ovid (1947 to 6 August 2021)
- CINAHL EBSCOhost (1972 to 9 August 2021)
- APA PsycINFO Ovid (1806 to August Week 1, 2021).

We also searched trial registers from inception on 10 August 2021:

- US National Institutes of Health Ongoing Trials Register ClinicalTrials.gov (www.clinicaltrials.gov; to 10 August 2021);
- World Health Organization International Clinical Trials Registry Platform (https://trialsearch.who.int; to 10 August 2021).

Other sources

We searched for additional reports of all included studies in the reference lists of their reports, by searching Google Scholar (scholar.google.co.uk) with the intervention name, project name and trial register number separately, and, if available, on the study's website. We scanned the reference lists of included studies to identify potentially eligible trials not already identified (backward citation searching). We exhaustively continued backward citation searching and identification of additional reports, including for all reports and studies included in the review through these same processes.

Search strategy

Search strategies for the database and trial register searches were developed and tested through an iterative process by an experienced medical information specialist in consultation with the review team. The full search strategies for all databases and trial registers are available in *Appendix 1*, including for CINAHL in *Table 23*.

The search contained the following concepts:

1. Older people or frailty.
2. Home-based or community interventions.
3. RCT filter.
4. 1 AND 2 AND 3.

Restrictions by publication status or language were not used.

Search terms were harvested by exploring three relevant systematic reviews and their included studies.[8,16,17] Their search strategies, as well as words and phrases in title, abstract and subject indexing were reviewed to find relevant search terms for inclusion. These terms were used to develop the initial draft search strategy. Extra search terms were found by reviewing results from that initial strategy. The PubMed PubReMiner (https://hgserver2.amc.nl/cgi-bin/miner/miner2.cgi) word frequency analysis tool was also used to find index terms and keyword terms for inclusion in the search strategy. For the concept 'home-based or community interventions', we included both broad and specific search terms as testing showed that this was necessary to capture all relevant interventions. We limited terms about geriatric nursing to community or home settings to increase the relevance of search results. Following testing, we also excluded some specific medical conditions in titles to increase the relevancy of the search results. For our MEDLINE search, we added the Cochrane Collaboration highly sensitive filter to identify randomised trials.[18] This was supplemented with a search filter developed to find Phase Three Trials not found by the Cochrane RCT filter.[19] For the Embase search, we used the filter for finding randomised trials in Embase developed by the Cochrane Collaboration.[20] For the PsycINFO search, we used a sensitive methodological search filter.[21] For the CINAHL search, we developed our own search strategy to identify randomised trials. The strategies were peer reviewed by another information specialist prior to execution using the Peer Review of Electronic Search Strategies (PRESS) checklist.[22]

Study selection

Eligibility criteria

Types of studies

Only RCTs and cRCTs were eligible. Where only one unit of randomisation (an individual or cluster) was allocated to an arm of a trial, we excluded the trial as the treatment effect is completely confounded with the unit. We accepted minimisation as a method of sequence generation, in keeping with Cochrane risk-of-bias (RoB) guidance.[23] We did not exclude variants of randomised trials such as stepped-wedge trials. Crossover and waiting-list designs were also eligible, but we only used outcome data from the pre-crossover period because it is likely that the older people's independence evolves over time and that, were interventions to be effective at modifying outcomes such as activities of daily living (ADL), this would be a long-term modification whose effects may carry over into the subsequent period of the trial.

Types of participants

We included studies involving older people living at home (mean age of study participants 65 years or older). We excluded trials in residential/nursing homes. If not all participants were living at home, we only included the study if data could be extracted specifically for these participants.

Types of intervention

Aligned with our focus on community-based complex interventions, trials were considered eligible if:

- the intervention was both initiated and mainly provided in the community
- the intervention included two or more interacting components (intervention practices, structural elements and contextual factors)
- the intervention was targeted at the individual person, with provision of appropriate specialist care
- a focus of the intervention was sustaining (maintaining or improving) the person's independence.

A broad range of interventions was eligible, differing in terms of how the service was organised and what was done to or for the older person. Our criterion of including two or more interacting components could be met in multiple ways. Eligible interventions could include multiple discrete practices, such as exercise sessions and nutritional advice. Alternatively, interventions could include one practice that interacted with other structural elements such as being reliant on general practice or other services; or interaction with contextual factors by being substantially tailored to the person's physical and social environment such as 'comprehensive geriatric assessment'[24] or rehabilitation interventions.

Interventions that were not eligible for inclusion were those where:

- the intervention was either not initiated, or not mainly provided, in the community, or neither for example interventions delivered in outpatient, day hospital, inpatient and intermediate (post-acute) care settings
- the intervention included only one component (intervention practices, structural elements and contextual factors), for example, if any of the following were delivered as single component interventions: a drug; treadmill training; yoga; provision of information; cataract surgery for visual impairment; hearing aid for hearing impairment; medication-review; nutritional supplements
- the intervention was not targeted at the individual person, with provision of appropriate specialist care for example general staff education (not training in a patient-level intervention), practice-level reorganisation, operational, managerial or information technology (IT) interventions, public health messages
- the intervention was not focused on sustaining (maintaining or improving) independence; for example, we excluded interventions that primarily addressed cognitive deficits, mood disorders or both, unless they also aimed to improve overall independence

- disease-focused case management of older people with specific long-term conditions; for example, diabetes, chronic obstructive pulmonary disease or depression
- interventions in which the primary focus was fall prevention were excluded as the evidence base for fall prevention is well established including via NMA.[25] Nonetheless, falls were an additional outcome of this review.

Initially we intended to only include interventions for which sustaining independence was the *main* aim, but this was broadened as complex interventions were rarely described as having one main aim.

Comparators

Usual care, 'placebo' or attention control or a different complex intervention which met our criteria were eligible comparators.

Outcomes

Studies were only included where outcome data were measured at a minimum 24-week (approximately 6 months) time point. We included studies that met the above criteria whether or not they measured or reported our outcomes of interest (see below).

Study selection process

Records identified from the literature searches were imported to EndNote (vX9.3.3; Clarivate Analytics, Philadelphia, PA, USA) and duplicates were removed. The results were imported into the Rayyan web application (https://rayyan.qcri.org/) (January 2020 search) or Covidence web application (www.covidence.org/) (September 2020 and August 2021 updates). Two researchers independently assessed the title and abstract in each record. Where a record referred to a report of a potentially eligible study, we obtained the full text of the report. Two researchers independently assessed inclusion against our pre-specified criteria, resolving disagreements by consensus with guidance from the PMG. We contacted study authors if further information was required. In cases where there may have been more than one reason to exclude a report, two reviewers reached consensus on a primary reason for exclusion, selecting the first eligibility criterion in our list of eligibility criteria that they were certain was not met. Where studies appeared eligible and to have finished data collection but had not published any results, we contacted the authors to request completed study results. Translation was arranged if necessary throughout the selection process. We excluded as 'ongoing' studies that had not been completed, or had finished data collection within 12 months of August 2021 but for which we had no results.[26] The results of the study selection process were imported into and managed within EndNote.

Data collection process

Two independent researchers collected data using a piloted data collection form in a purpose-built database in Microsoft Access (v16.0; Microsoft Corporation, Redmond, WA, USA). Characteristics of included studies tables were produced from this database. The characteristics of excluded studies table was manually produced via our EndNote library.

Study-level data

We sought the following details for each study:

- study report citations (i.e. authors, date and location of report)
- sponsorship/funding source(s)
- country
- aims and rationale
- type of RCT design – randomised by individual or cluster, parallel group or crossover. If cluster, level(s) of clustering
- analysis details (e.g. intention to treat).

We also sought the following characteristics regarding their participants:

- brief characterisation
- inclusion and exclusion criteria
- age (range and/or means)
- gender percentages
- frailty status (see *Assessment of frailty*)
- health status
- living arrangement
- carer presence
- ethnicity
- total number of participants (and clusters) randomised into each group.

Trial arm (intervention) level data

- number of participants allocated (and clusters where appropriate)
- experimental nature of arm within the study (experimental/control).

Additionally, details of the intervention as specified by the Template for Intervention Description and Replication (TIDieR)[27] were coded and summarised in NVivo (see *Intervention grouping*).

Outcomes of interest

We collected details of the outcomes measured by the included studies and sought to collect quantitative data and results on the following outcomes:

Main outcomes

- Living at home.
- Activities of daily living (personal/instrumental).
- Hospitalisation.
- Care-home placement.
- Homecare services (non-healthcare professional) usage.
- Costs.
- Cost-effectiveness.

Additional outcomes

- Health status/health-related quality of life.
- Depression.
- Loneliness.
- Falls.
- Mortality.

We worked with our PPI FOG to identify key outcomes, and prioritise them as 'main' or 'additional', from the perspective of older people. Originally (prior to analyses beginning) these outcomes were proposed as one primary outcome (living at home) with the others as secondary outcomes.

We sought binary data for living at home, homecare services usage, hospitalisation, care-home placement, falls and mortality; and continuous data for activities of daily living, homecare services usage, hospitalisation, costs, cost-effectiveness, health status, depression, loneliness and falls. We excluded bespoke metrics without evidence of evaluation of measurement properties, or metrics where significant problems with their use are recognised.

Specifically, for binary outcomes, we sought to extract the total number of participants in each intervention and control group, and the number of outcome events, alongside any reported effect measures and their 95% confidence intervals (CIs), such as risk ratios (RRs) or odds ratios (ORs). For continuous outcomes, we sought to extract the total number of participants in each intervention and control group, the mean and standard deviation (SD) of the outcome in each group at baseline and at follow-up, and the mean and SD of the change score for each group. These estimates were extracted alongside any reported effect measures, such as the mean difference (MD) in final score or change score, or the ANCOVA (adjusted for baseline) result and a measure of variance such as the standard error. Where the above estimates were unavailable within publications, we attempted to recover these using alternate available information so as to avoid selection bias (e.g. using reported elements of the five-number summary, CIs, *p*-values, 2 × 2 contingency tables etc., to recover mean (SD) or ORs/RRs).

Where living at home was not a reported study outcome but care-home placement and mortality were, we calculated living at home as the remainder (not dead or living in a care home) where it was possible to do so without double-counting participants. Where care-home placement results related to all participants including those who had subsequently died, we could not disaggregate those who had died while living at home and so could not use these results.

Care-home placement as a standalone outcome was only included where it related to care-home residence at that time point, that is the figures excluded mortality during the period of reporting.

Time points

For all outcomes of interest, data were extracted and categorised for three time frames shown in *Table 1*.

Where more than one time point was reported for an outcome within a range specified above, we used the time point nearest to the target time point.

Because of the large number of outcomes and multiple time frames, we limited analyses of additional outcomes to the medium-term time frame only. We anticipated that the medium term would be of particular interest to commissioners and older people, would be most likely to allow sufficient time for effects to be realised but not washed out, and when most data would be available. We planned to conduct sensitivity analyses and meta regression for the medium-term time frame initially and to extend these to short- and long-term networks in the presence of significant findings.

Throughout the rest of the report we refer to results of interest, which we define here as reported data about a comparison between two arms of a trial for an outcome of interest in one of our analysis time frames.

Other outcomes

We listed all other outcomes measured by included studies but did not collect the results data.

TABLE 1 Time frames for analyses

Label	Target time point	Range
Short term	6 months	24 weeks to 9 months
Medium term	12 months	> 9 months to 18 months
Long term	24 months	> 18 months

Intervention grouping

We grouped all eligible interventions (including comparators) in preparation for NMA in a three-stage process.

1. We used an extended version of the TIDieR framework to code and summarise reported interventions in NVivo 12 (QSR International Pty Ltd, Hawthorn East, VIC, Australia).[27] The TIDieR framework includes 12 key items (see *Table 2*). We added a further item regarding the organisational details of the intervention, such as the roles and responsibilities of the intervention providers, means of co-ordination, organisational boundaries and links and financial arrangements. One reviewer coded and summarised each intervention and at least one reviewer (TFC) assessed these and resolved any disagreements by consensus discussion. In the earlier stages, to improve consistency between reviewers, an additional reviewer made an assessment before it was assessed by TFC.
2. We categorised the coding using the principles of content analysis to inform provisional groupings.[28] This categorisation was also considered by at least two reviewers and disagreements were resolved by consensus, involving the PMG where necessary.
3. We developed initial intervention groupings with consideration for service organisation, care processes and specific patient care (e.g. exercise, ADL practice). Through internal discussions involving reviewers and the PMG, including reflections about existing frameworks,[29,30] the practical restraints of what was reported and the diversity of interventions, we based our groups on the actions that were intended to be provided to all or almost all participants. These actions determined the components that we used to group an intervention. Interventions that were grouped together were

TABLE 2 TIDieR items and additional organisational item

TIDieR item	Description
1. Brief name	The brand name of the intervention (if any) and, if not descriptive, a short description.
2. Why	Rationale, theory or goal of the elements essential to the intervention.
3. What (materials)	The physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery/training of intervention providers.
4. What (procedures)	The procedures, activities and/or processes used in the intervention, including any enabling or support activities.
5. Who provided	The expertise, background and any specific training given to each category of intervention provider.
6. How	The modes of delivery (such as face-to-face or by some other mechanism) of the intervention, and whether it was provided individually or in a group.
6b. How organised (additional item)	The roles and responsibilities of the intervention providers, means of co-ordination, organisational boundaries and links and financial arrangements.
7. Where	The types of location where the intervention occurred, and any required infrastructure.
8. When and how much	The amount and intensity of intervention delivered, including number of sessions, their schedule, duration and dose and the overall time frame in relation to triggering events.
9. Tailoring	Details of any individual/group adaptations, personalisation or titration.
10. Modifications	Details of any changes made to the intervention during the course of the study.
11. How well (planned)	Strategies to achieve fidelity or adherence and planned assessment of fidelity.
12. How well (actual)	Extent of intervention fidelity achieved.

compared and contrasted with subsequent refinement to coding, components and grouping. We presented our provisional groupings to experts including policy-makers, commissioners, older people and carers for open discussion. These led to further revision of our intervention groups and their descriptions (see *Chapter 3, Results of the review* for details). The intervention groups became the nodes in the NMA.

Assessment of frailty

We expected that a range of validated instruments and operationalised measures would be used to identify pre-frailty and frailty in included trial populations of some studies. Examples of such frailty measures include: the use of the Fried phenotype model, cumulative deficit frailty index (FI), the Tilburg Frailty Indicator, Groningen Frailty Indicator, Clinical Frailty Scale, Hebrew Rehabilitation Center for Aged Vulnerability Index, Vulnerable Elders Survey, Brief frailty measure derived from the Canadian Study of Health and Ageing or a formally produced Frailty Index. We classified the trial population in accordance with the frailty measure, so long as it was developed or validated according to the modern meaning of frailty (loss of biological reserves, failure of physiological mechanisms and vulnerability to experiencing adverse outcomes after minor stressor events) and not as a generic term for being old or disabled. We reported methods used for each study, including cutpoints for identification of pre-frailty and frailty.

We also expected that many studies would not formally have described study populations in terms of frailty. In such circumstances two reviewers with extensive clinical academic frailty expertise (AC and JG) independently used the well-validated phenotype model as a framework to categorise study-level frailty profile (robust; pre-frailty; frailty) of trial participants if the relevant variables were reported.[31] The model is based on five characteristics (weight loss; exhaustion; low energy expenditure; slow gait speed; low grip strength). Evidence of ≥ 3 indicates frailty, 1–2 pre-frailty and 0 robust. In the remaining studies where neither a recognised frailty measure nor the variables needed to apply the frailty phenotype categorisation were reported, the two reviewers independently attempted to classify the populations based on trial eligibility criteria and/or reported baseline characteristics closely linked to frailty including gait speed, hand grip strength, mobility, activity or disability levels. Any disagreements were resolved by consensus.

In categorising study level frailty, we recognised that trials included participants across different frailty categories, so as well as 'robust', 'pre-frail' and 'frail', our categories also included 'robust and pre-frail', 'pre-frail and frail' and 'all'. Where we were not able to classify the population, we labelled it 'unclassified'.

We planned for our main analysis of the impact of frailty to only include trials that were categorised according to a validated measure, with subsequent analyses including all categorised trials. However, we categorised insufficient trials according to a validated measure to enable this approach, so our analyses do not distinguish between the methods of categorisation.

Risk-of-bias assessment

Two reviewers independently assessed RoB in each result of interest from each included study, using the Revised Cochrane risk-of-bias tool for randomised trials (RoB 2).[32,33] Disagreements were resolved by consensus between the reviewers or through discussion with the PMG. Our effect of interest was the effect of assignment to the intervention ('intention-to-treat' effect). For individually randomised studies, we assessed RoB in five domains:

1. bias arising from the randomisation process
2. bias due to deviations from intended interventions
3. bias due to missing outcome data

4. bias in measurement of the outcome
5. bias in selection of the reported result.

For cRCTs, we used the latest guidance[34] to assess identification/recruitment bias, and the other issues such as loss of clusters detailed in section 23.2: Assessing RoB in cluster-randomised trials, of the Cochrane Handbook Version 6.[9] This assessment resulted in two domains of bias in place of domain 1: 1a, bias arising from the randomisation process, and 1b, bias arising from the identification or recruitment of participants. Other details were integrated within the same domains as for individually randomised trials.

For each domain, we made a judgement of high RoB, low RoB or some concerns. We used the signalling questions and algorithms and considered whether to override the result, recording our reasons and supporting evidence. For domain five, in the absence of a pre-specified analysis plan we judged the risk to be low when the result being assessed was very unlikely to have been selected on the basis of the results from multiple eligible outcome measurements or from multiple eligible analyses of the data.

For each assessed result of interest, we summarised our concerns and reached an overall risk-of-bias judgement that was at least as severe as the most severe domain risk. Although we considered whether to upgrade the severity where multiple domains were rated as some concerns (and none as high), we did not do so. We also judged whether a result at high RoB posed serious concerns (only one domain at high risk) or very serious concerns (more than one domain at high RoB or very serious concerns in relation to one domain). These judgements then fed into our GRADE assessment of RoB, consistent with GRADE and Cochrane recommendations regarding the association between RoB in individual results and the results of analyses.[35,36]

We used the RoB 2 Excel tools (version 8 for individually randomised studies, version 3 for cluster-randomised studies, available from www.riskofbias.info/welcome/rob-2-0-tool) to manage our assessments and check consistency between reviewers. We resolved any disagreements by consensus. We imported these assessments into our Access database and presented domain level and overall judgements with a summary of the reasons any domain was not rated as low RoB.

Data synthesis

Summary measures

For each trial and each outcome separately, effect estimates and CIs that compared intervention and control groups were either extracted from the trial publication or calculated based on other reported information (e.g. number of outcome events and participants per group; mean and SD of follow-up scores, etc.). For continuous outcomes, we used standardised mean difference (SMD, specifically Hedges' *g*) for outcomes with different measures for similar constructs (ADL, depression, self-evaluation of health status) across the trials. Where continuous outcome measures used a mix of measures favouring higher or lower values, the measures in one direction were reversed so that for a particular outcome, all trials measured improvement in outcome in the same direction.

For binary outcomes, we extracted or calculated RRs and ORs. For survival (time-to-event) outcomes, hazard (rate) ratios were extracted. Any details about non-proportional hazards were also extracted. Both adjusted and unadjusted results were extracted, though in practice unadjusted results were used in the synthesis due to a combination of heterogeneity in adjustment factors across studies and a sparsity of evidence to enable synthesis. Where effect estimates were calculated using 2 × 2 contingency tables which contained zero cells, a continuity correction of 0.5 was applied to all cells.

Effect estimates reported from cluster-randomised trials were included directly in cases where the original research had appropriately accounted for the clustered nature of the data in their analyses

(e.g. multilevel modelling). Where studies were found to have ignored clustering in their analyses, we adjusted for this by reducing the sample size to the 'effective sample size' using the 'design effect' as a divisor for the original sample size. For stepped-wedge trials, we only included data from analyses that appropriately accounted for time trends.

Results of outcomes at all time points were recorded and placed into categories (around 6 months, 12 months and 24 months; see *Table 1*). We conducted meta-analysis separately for each of these three time frames for our main outcomes, and for the medium-term time frame for our additional outcomes as described in time points above.

For care-home placement and hospitalisation, our meta-analysis summarised the odds of this occurring for a participant, rather than counts, for example. We evaluated personal ADL and instrumental ADL as separate outcomes and did not additionally meta-analyse combined personal and instrumental ADL instruments. We did not combine all measures of health status due to differences in the underlying constructs. We chose to meta-analyse single global self-assessments of health status as it is readily interpretable and the most widely available measure. We tabulated results that we did not include in meta-analysis.

Methods of analysis

We meta-analysed the extracted effect estimates using modules within Stata, including metan, mvmeta and network.[37] Random-effects meta-analyses were conducted, to allow for potential between-study heterogeneity in each intervention effect.[38] Restricted maximum likelihood (REML) estimation was used to fit all the models and 95% CIs were calculated using the Wald-based approach, but with inflated variances to account for uncertainty in the estimated variances, similar to the approach of Hartung–Knapp but using a normal approximation instead of a *t*-distribution.[39,40]

Initially, for each outcome separately, we performed a separate meta-analysis for each type of intervention versus control, to provide summary effectiveness results based only on direct evidence. We summarised ORs for binary outcomes, and pooled (standardised) MDs for continuous outcomes. We found insufficient estimates to allow pooling of hazard ratios (HRs) for survival outcomes. We displayed forest plots, with study-specific estimates, CIs and percentage study weights, alongside the summary (pooled) meta-analysis estimates, 95% CI for the summary effect, and (if possible) a 95% prediction interval for the intervention effect in a new study similar to one of those included in the meta-analysis.

Heterogeneity was summarised by the estimate of between-study variance [tau (τ)], the proportion of the total variance due to between-study variance [*I*-squared (I^2)] and 95% prediction intervals, as mentioned above.

Summary ORs were converted to a summary RR and multiple corresponding absolute intervention risks and risk differences; SMDs were re-expressed as the MD of a common measure of the outcome as described in *Confidence in cumulative evidence*.

Network meta-analysis

A NMA was conducted (for each outcome and time frame separately), using a multivariate random-effects meta-analysis framework (where possible) via the network module in Stata using REML estimation.[37,41] This allowed both direct and indirect evidence to contribute towards each intervention effect (treatment contrast), via a consistency assumption. Where multiple studies were not available for any individual comparison (i.e. no degrees of freedom available to estimate heterogeneity) a common-effect model was fitted. The within-study correlation of multiple intervention effects from the same trial (i.e. in multigroup trials) was accounted for, and a common between-study variance assumed for all treatment contrasts in the network (thus implying a +0.5 between-study correlation for each pair of treatment effects). Summary (pooled) effect estimates for each pair of treatments in the network, with

95% CI, and (if possible) 95% prediction intervals were calculated. For binary outcomes, we chose to synthesise natural log-transformed ORs (ln ORs), as the OR is more portable across different baseline risks than the RR.[42]

Based on the results, the ranking of intervention groups was calculated using resampling methods based on the (approximate) posterior distribution of treatment effect, and quantified by the probabilities of being ranked first, second, … , last, together with the mean rank and the Surface Under the Cumulative RAnking curve (SUCRA). Network diagrams, tables split between NMA and pairwise evidence and rankograms were used to graphically display the network set-up, results and rankings.

Certainty assessment

Assessment of inconsistency

The consistency assumption (that direct and indirect evidence were consistent with each other on average) was examined for each treatment comparison where there was direct and indirect evidence (seen as a closed loop within the network plot). This involved estimating direct and indirect evidence, and comparing the two using Wald tests, with a global test across all evidence indicating inconsistency if the *p*-value was < 0.05. Due to the low power associated with global tests, the node-splitting method of Dias *et al.* was also used to test for inconsistency separately between each treatment comparison, again *p*-values < 0.05 indicated the presence of inconsistency.[43,44] If evidence of inconsistency was found, explanations were sought and resolved. Where there were no closed loops in any individual network (i.e. no degrees of freedom to estimate inconsistency), the model was reduced to a so-called 'consistency' model whereby the inconsistency parameter in the model was set to zero for all comparisons under the assumption that consistency would hold.

Investigation of small-study effects

We planned that if there were 10 or more studies in a pairwise meta-analysis, funnel plots would be presented to investigate small-study effects (potentially caused by publication bias) and tests of asymmetry performed (Egger's, Peter's and Debray's for continuous, binary and survival outcomes, respectively); however, no pairwise meta-analyses included 10 or more studies. If there were 10 or more studies in an NMA, 'comparison-adjusted' funnel plots comparing intervention with control were presented to investigate small-study effects, under the assumption that such effects would apply to the whole field.[45,46]

Examination of frailty impact

Meta-analysis results were initially presented for all levels of frailty combined, then for frailty/pre-frailty where reported data permitted. Impact was further examined by extending the standard NMA to a network meta regression, with frailty/pre-frailty as a study-level categorical covariate allowing effects of frailty/pre-frailty to vary for each treatment effect, to quantify if intervention effects varied according to population-level frailty. Where possible, we kept the 'all' (robust, pre-fail and frail) category (or the lowest available category) as the reference to calculate the relative effect of frailty using meta regression.

As described above, we planned for our main analysis of the impact of frailty to only include trials that were categorised according to a validated measure, with subsequent analyses including all categorised trials. However, we categorised insufficient trials according to a validated measure to enable this approach, so our analyses do not distinguish between the methods of categorisation.

Additional analyses

Sensitivity analyses were conducted excluding results at the highest RoB (very serious concerns). We chose not to exclude all studies at high RoB while conducting risk-of-bias assessment, when it became apparent we would be able to conduct few sensitivity analyses using this approach. We planned to run additional sensitivity analyses to present results of more recent evaluations, restricted to trials in the last 15 years but decided not to given the volume of networks and their sparsity.

Confidence in cumulative evidence

We used the GRADE framework, adapted for NMA, to rate evidence quality of the results of our NMA.[10,36,47,48] We generated GRADE evidence profiles for our individual intervention groupings in comparison to a reference control for each outcome separately. We initially planned to use GRADE alone and subsequently planned to use the confidence in network meta-analysis (CINeMA) approach to inform our overall GRADE rating.[49] However, the CINeMA software produced errors for many of our analyses due to their sparseness and so we reverted to using GRADE.

As we included RCTs and cRCTs, the starting point was a high-quality evidence rating. We assessed the quality of direct and indirect treatment estimates separately and combined in NMA,[48] with a focus on first-order loops for assessment of indirect treatment estimates. We assessed the domains of RoB, inconsistency (between-study heterogeneity), indirectness and publication bias (non-reporting bias) in the direct and indirect evidence, and additionally imprecision and incoherence (direct and indirect estimate inconsistency) for the combined network estimate. We made an overall judgement on whether the quality of evidence for an individual outcome warranted downgrading on the basis of study limitations in each of the domains, aligned with GRADE guidance.[36]

For imprecision, we considered the 95% CI in relation to cut points for no effect and very small effect (positive and negative, see below). We also considered the ratio of the 95% CI limits for the OR, and whether the effective sample size was at least 800 for continuous outcomes or sufficient for 400 events for dichotomous outcomes, following the approach of Brignardello-Petersen *et al.*[47,50]

Summary of findings tables were produced using a semi-automated workflow involving Microsoft Excel (v16.0; Microsoft Corporation, Redmond, WA, USA) and Microsoft Word (v16.0; Microsoft Corporation, Redmond, WA, USA) based on recommended formats.[35,51]

We described interpretation of the evidence following recent guidance,[52] providing an indication of size and direction if the evidence was not very low certainty. We used the terms ‘probably’ and ‘may’ to indicate moderate and low certainty, respectively.[52,53] Where the point estimate was large but the evidence was low certainty, we described only the direction in the text as we were not assessing certainty in the size of the estimate; in these cases, we described the size alongside the statistical summary.

For effect sizes expressed as SMD, we took 0.05 to be the lower bound for a very small effect, 0.16 to be a small effect, 0.38 to be a moderate effect, 0.76 to be a large effect and 1.2 and above to be a very large effect, based on empirical evidence of effect sizes in gerontological research.[54] We re-expressed SMDs as MDs using a pooled SD for a common measure of the outcome from the included studies.[35]

We re-expressed ORs (and 95% CIs) as RRs using the median risk in the reference comparator arms, and as absolute effects (corresponding intervention risk and corresponding risk difference) for a high- and low-risk population, using the highest and lowest risk among the reference comparator arms with more than 100 participants as the assumed comparator risks.[35] By reference to other commonly used interventions in fields such as stroke prevention and hypertension, we noted that number needed to

treat to benefit (NNTB) for major outcomes was often between 50 and 100, and sometimes larger.[55–57] Based on this, we arbitrarily selected NNTB = 200 as a limit for important difference and used the corresponding risk difference for the high-risk population to define effect sizes as very small (5 per 1000), small (20 per 1000), moderate (40 per 1000), large (60 per 1000) or very large (100 or more per 1000).

Summary of economic evidence

Following the brief economic commentary framework recommended in the Cochrane Handbook, version 6,[58] we extracted and summarised brief details of the analytic perspective, time horizon, evaluation type(s), main cost items, currency, price year, any reported details about discounting and sensitivity analysis, the principal findings which applied to this review's time periods and outcomes of interest, and verbatim text of conclusions of each identified study. We then compared and contrasted the findings from similar interventions (classified in the same intervention group) and between different intervention groups, based on the conclusions of these studies.

We used the definitions stated in the 'Glossary of Terms for Health Economics and Systematic Review' from the Campbell and Cochrane Economics Methods Group[59] to classify the three full economic evaluation types[60] – cost-effectiveness analysis, cost-utility analysis and cost–benefit analysis. We classified analysis of comparative costs for alternative interventions in monetary value of the resources used as cost analysis (partial economic evaluation).[58,61] We identified the cost item categories reported in each of these studies and used these to identify the evaluation perspective. The cost items were classified into four categories: health sector costs, other sector costs, patient and family costs and productivity impacts.[58,61] An evaluation that included the monetary expenses on health and/or social care was regarded as adopting a health and social care system perspective. If non-monetary, intangible resources for care or economic impacts associated with the intervention were also included in the total costs, for example informal care provided by family or friends, productivity loss, the evaluation perspective was classified as societal. Additionally, we extracted the intervention cost items if they were provided separately. We did not further assess the quality of the identified economic evaluations.[58]

Chapter 3 Results of the review

Study selection

The results of the search and selection process are summarised in a PRISMA 2020 flow diagram (see *Figure 1*).[62]

Results of the search and selection process

We found 49,894 records through database searches and 1286 records through trial register searches. After removal of 11,068 duplicates, we screened 40,112 records. We excluded 39,318 records through screening and sought, retrieved and reviewed the full text of the remaining 794 reports. Later, we identified and screened an additional 179 records by backward citation searching of included studies (*n* = 19) and from searching for additional reports of included studies (*n* = 160). In total, therefore, we assessed 973 reports for eligibility and excluded 477, finally including 129 studies[63–191] consisting of 496 reports (see *Figure 1*): 123 studies from the electronic searches and six studies from the citation searches. Of these 129 studies, 113 provided results for the outcomes of interest and 90 contributed to the NMAs.

Excluded studies

Details of the studies excluded following assessment for eligibility are provided in *Figure 1* above and *Report Supplementary Material 2*, and are summarised below. Additionally, a brief summary of the interventions excluded (where this was the reason for exclusion) is provided in *Report Supplementary Material 2*.

We excluded 24 studies[192–215] (32 reports) as ongoing because the trial or the analyses were not completed and results were unavailable as of 31 August 2021, according to their respective trial register records. The collective total of their planned sample sizes is approximately *n* = 9218.

We had insufficient information to confirm the eligibility of five studies[216–220] (six reports), despite attempts to contact the authors and searches for additional reports. For these studies, we only found trial register records, protocols or conference abstracts.

We assessed 439 reports as ineligible: 77 did not relate to a RCT or a cRCT; 32 had participants with a mean age < 65 (*n* = 6) or who were not living at home (*n* = 26); 271 were ineligible because of the intervention, which was not community based (*n* = 115), had a single component only (*n* = 33), did not target the individual (*n* = 2), did not aim to sustain independence (*n* = 106), targeted a specific condition (*n* = 12) or was for fall prevention (*n* = 3); 24 were ineligible because of the comparator, which was not community based (*n* = 7), was a single component intervention (*n* = 14), or did not target the individual (n = 3); and 35 were ineligible because there was no follow-up at 24 weeks or later.

Some excluded studies were part of a larger project from which other studies were included. These projects included PRevention in Older people – Assessment in GEneralists' practices (PRO-AGE), Community Aging in Place – Advancing Better Living for Elders (CAPABLE) and Assessment of Services Promoting Independence and Recovery in Elders (ASPIRE). PRO-AGE consisted of three RCTs, two of which were eligible,[104,164] while the third was ineligible as it was not delivered in a community setting.[221] This third study provided the baseline for a cohort, from which another eligible study was included.[151] We included two studies of the CAPABLE intervention[166,167] but excluded a non-randomised study[222] and a trial of two implementation strategies of the same intervention.[223] The ASPIRE project consisted of three RCTs, two of which were included[146,147] while the third was ineligible because the intervention was partly delivered in residential care facilities.[224]

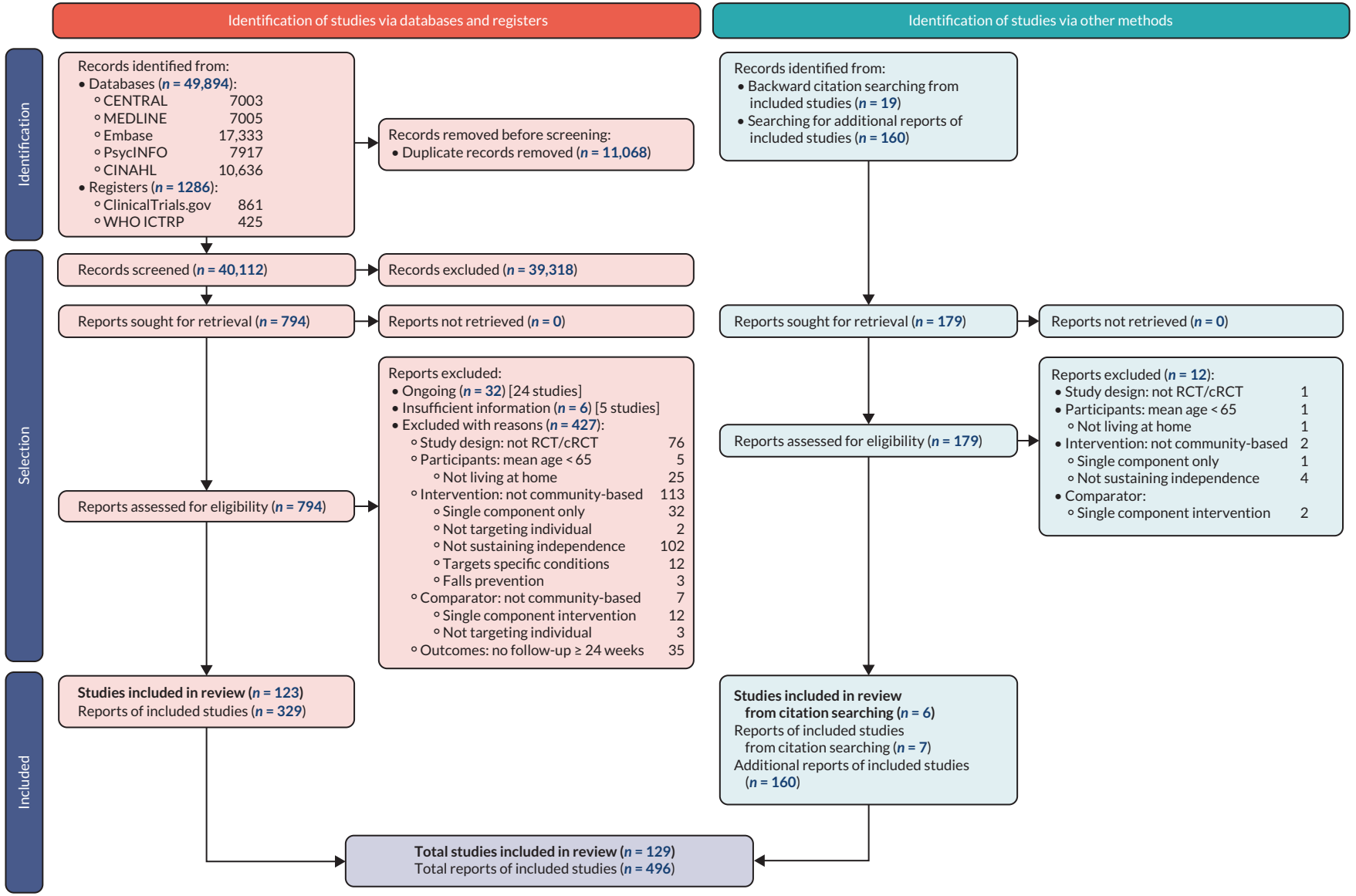


FIGURE 1 PRISMA flow diagram showing identification, selection and inclusion of studies from databases, registers and other sources.

Studies included in the review

Characteristics of included studies are provided as *Report Supplementary Material 1*; a summary is provided in *Table 3*.

The 129 studies assigned 74,946 participants to an intervention, with a range of 30 to 4224 participants per study {mean 595, median [interquartile range (IQR)] 313 (168–582) participants from 126 studies; 3 studies missing data]. Most were individually randomised but 22 were cluster RCTs; these had a total of 845 clusters [mean 40, median (IQR) 31 (14–55), range 8 to 164 clusters, 1 study missing data}.

Context

The 129 studies enrolled participants between 1963 and 2018 and were published between 1971 and 2021. They took place in 23 countries or regions in four continents: predominantly Europe (64 studies) and North America (41 studies), the rest from Australasia (13 studies) and Asia (11 studies). The most common sources for recruitment were invitations via general practice or a primary care health centre, homecare services, service referrals, health insurance, selections from census or municipal records and community advertisement.

Participants

Sixty-one per cent of participants were women, reported in 123 studies. In 113 of these, most of the participants were women. Forty-six per cent of participants were living alone, reported in 77 studies. Three studies required a consented caregiver to participate with the participant.[82,91,171] Nineteen studies excluded participants with disabilities or who were dependent in activities of daily living.[86,97,99,101,104,108,114,119,124,135,140,141,156,157,164,170,184,185,190]

Age

The pooled mean age of participants was 77.3 (SD 7.5) years, reported in 97 studies. Four studies had study populations aged 85 years or over on average (mean or median);[74,95,102,113] only one study's population was < 70 years on average (mean 68.4 years).[66] Most of the studies explicitly targeted older adults, except three where all adults were eligible.[66,71,174] A minimum age was either reported or an eligibility criterion in all but 8 studies: under 65 years in 20 studies (16–18 years: *n* = 3; 50 years: *n* = 3; 60 years: *n* = 14), 65–79 years in 90 studies (65–69 years: *n* = 46; 70–74 years: *n* = 20; 75–79 years: *n* = 24), 80 years or over in 5 studies,[74,85,96,102,113] and 6 studies had criteria where minimum age differed in conjunction with ethnicity,[116,145–147] medical condition[143] or both.[130]

Frailty

One-hundred and eight study populations were classified for frailty (21 were insufficiently described to be classified[64,71,72,77,80,82,83,86,100,106,110,111,115,124,126,128,140,142,143,156,174]): 31 included all frailty levels (robust, pre-frail and frail), 3 populations were robust, 5 were robust and pre-frail, 8 were pre-frail, 25 were pre-frail and frail and 36 were frail. The studies that had populations classified as 'all' typically had broad inclusion criteria, although some purposefully sampled multiple risk or frailty groups, and others were selective on health-related criteria but in a way that would include all frailty categories. Ninety-one populations were classified on the basis of characteristics and criteria, while 17 were classified on the basis of a validated measure, of which 2 were classified as all,[102,176] 4 as pre-frail,[89,96,157,186] 7 as pre-frail and frail[69,121,122,135,144,153,180] and 4 as frail.[75,136,170,179]

Excluded groups within included studies

Twelve studies reported on groups of participants which were ineligible for this review and have been excluded from all results.[70,98,103,106,114,121,126,144,149,160,177,183]

Hall 1992[103] and Siemonsma 2018[160] reported about separately recruited, non-randomised observational control groups alongside their trial results, which were excluded from this review. Hay

TABLE 3 Summary characteristics of included studies

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Alegria 2019[63,225,226]	RCT	2015	USA	P	307	exrc & psyc	ac	–	–	–	▦	–	–	–	–	–	○	○	–	–	♦	NC
Arthanat 2019[64,227,228]	RCT	>2005	USA	U	97	comm	ac	–	–	–	–	–	–	–	–	–	–	–	–	–	○	NC
Auvinen 2020[65,229–231]	RCT	2015	FIN	F	512	hmcr & med	hmcr	–	♦	♦	–	▦	–	–	–	–	▦	▦	–	–	♦	NC
Balaban 1988[66]	RCT	1981	USA	F	198	mfa-(w/med)	ac	–	–	♦	–	▦	–	○	–	–	▦	▦	–	–	▦	NC
Barenfeld 2018[67,232–235]	RCT	2012	SWE	all	131	educ	ac	–	–	–	–	–	–	–	–	–	○	○	–	○	♦	NC
Bernabei 1998[68,236,237]	RCT	1995	ITA	F	200	hmcr & mfar(w/med)	hmcr	–	♦	♦	–	▦	▦	▦	▦	–	–	♦	–	–	♦	NC
Bleijenberg 2016[69,238–246]	cRCT	2010	NLD	P,F	m:39; 3092	rsk-mfa-; rsk-mfa-	ac	–	–	♦	▦	▦	–	○	▦	○	▦	♦	–	–	♦	NC
Blom 2016[70,245,247,248]	cRCT	2009	NLD	all	m:59; 1379	mfa-(w/med + slfm)	ac	♦	♦	♦	▦	▦	▦	♦	▦	▦	♦	♦	▦	–	♦	NC
Borrows 2013[71]	RCT	2008	GBR	U	36	aids	mfa-	–	–	▦	–	–	–	–	–	–	▦	–	–	–	♦	NC
Botjes 2013[72,249,250]	RCT	2011	NLD	U	218	mfa-	ac	–	–	–	○	–	–	–	–	–	○	–	○	–	–	NC
Bouman 2008[73,251–255]	RCT	2002	NLD	P,F	330	mfar(w/med)	ac	–	♦	♦	○	♦	▦	▦	▦	▦	♦	♦	▦	–	♦	NC
Brettschneider 2015[74,256–259]	RCT	2007	DEU	F	336	mfar(w/med)	ac	–	♦	♦	–	–	–	▦	▦	▦	♦	○	–	▦	♦	NC
Cameron 2013[75,260–269]	RCT	2008	AUS	F	241	exrc & mfar(w/med + slfm)	ac	–	–	♦	–	♦	–	▦	▦	▦	♦	♦	–	▦	♦	NC
Carpenter 1990[76]	RCT	<2006	GBR	all	539	rsk-mfa-	ac	♦	–	–	–	▦	–	♦	–	–	–	–	–	▦	▦	NC

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Cesari 2014[77,270–275]	RCT	> 2005	FRA	U	?	mfar(w/med)	ac	–	–	–	○	–	–	–	–	–	○	○	–	–	–	NC
Challis 2004[78,276]	RCT	1998	GBR	F	256	mfar(w/med)	mfar	♦	–	▦	–	▦	–	▦	▦	–	–	▦	–	–	▦	NC
Clark 1997[79,277–281]	RCT	1994	USA	R,P	361	eng & educ	ac	–	♦	♦	–	–	–	–	▦	▦	–	♦	–	–	○	Mx
Clark 2012[80,282–287]	RCT	2004	USA	U	460	eng & educ	ac	–	–	–	–	–	–	–	▦	▦	▦	▦	–	–	▦	NC
Coleman 1999[81]	cRCT	< 2006	USA	F	m:9; 169	educ & mfar(w/med + slfm)	ac	–	–	–	–	▦	–	–	▦	–	○	▦	–	▦	♦	NC
Counsell 2007[82,288–292]	cRCT	2002	USA	U	m:164; 951	educ & mfar(w/med + slfm)	ac	–	▦	▦	–	▦	–	–	▦	–	▦	▦	–	–	♦	NC
Cutchin 2009[83,293]	RCT	2008	USA	U	110	mfar	ac	–	–	–	▦	○	–	○	–	–	▦	♦	–	–	–	NC
Dalby 2000[84,294]	RCT	< 2006	CAN	F	142	mfar(w/med)	ac	♦	–	–	–	▦	–	▦	–	–	–	–	–	–	♦	NC
de Craen 2006[85,295–297]	RCT	2000	NLD	all	402	mfa-	ac	–	–	–	▦	–	○	–	–	–	–	○	▦	–	♦	NC
Dorresteijn 2016[86,298–301]	RCT	2009	NLD	U	389	ADL	ac	–	♦	♦	▦	–	–	–	▦	▦	▦	○	–	▦	♦	NC
Dupuy 2017[87,302]	RCT	> 2005	FRA	P,F	32	hmcr & aids & comm	hmcr	–	?	–	▦	–	–	–	–	–	–	–	–	–	–	NC
Fabacher 1994[88]	RCT	< 2006	USA	all	254	mfar(w/med)	ac	♦	♦	♦	–	▦	–	♦	–	–	–	○	–	▦	♦	NC
Fairhall 2015[89,303,304]	RCT	2013	AUS	P	230	mfar(w/med)	ac	–	–	○	○	○	–	○	–	–	○	○	–	○	○	NC

continued

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Faul 2009[90,305]	RCT	–	USA	R,P	81	educ & exrc & mfar(w/ med + slfm); exrc & mfa-(w/ med + slfm)	–	–	○	–	–	–	–	–	–	–	○	○	–	–	–	NC
Fernandez-Barres 2017[91,306,307]	RCT	2010	ESP	F	173	hmcr & ntr	hmcr	♦	–	♦	–	–	–	♦	–	–	–	♦	–	–	♦	NC
Fischer 2009[92,308]	RCT	2004	DEU	all	4224	eng & mfa-(w/ slfm)	ac	♦	–	–	–	▦	–	♦	○	–	–	–	–	–	▦	?
Ford 1971[93,309]	RCT	1963	USA	P,F	300	mfar(w/med)	ac	♦	–	○	–	▦	–	♦	–	–	–	–	–	–	▦	NC
Fox 1997[94]	RCT	1994	USA	all	237	mfar(w/ med + slfm)	mfar(w/ med)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NC
Fristedt 2019[95,310]	RCT	2015	SWE	F	62	hmcr & mfar(w/ med)	hmcr	–	–	○	–	▦	○	–	○	–	–	–	–	–	♦	NC
Gene Huguet 2018[96]	RCT	2016	ESP	P	200	med & ntr & exrc	ac	–	♦	♦	–	–	–	–	–	–	–	–	–	–	–	NC
Gill 2002[97,311–314]	RCT	< 2006	USA	P,F	188	ADL & exrc	ac	–	▦	▦	–	–	–	○	○	–	–	–	–	▦	♦	NC
Giné-Garriga 2020[98,315–325]	RCT	2016	EEE	R	1360	exrc	ac	–	–	–	–	–	–	–	–	–	○	○	○	○	–	NC
Gitlin 2006[99,326–336]	RCT	2003	USA	P,F	319	ADL & aids & exrc	ac	–	♦	♦	–	–	–	○	▦	▦	–	○	–	–	♦	NC
Grimmer 2013[100,337]	RCT	2014	AUS	U	?	mfa-	ac	–	–	?	–	○	–	–	–	–	○	–	–	○	–	?
Gustafson 2021[101,338,339]	RCT	2013	USA	all	390	aids & educ & comm	ac	–	–	–	▦	○	–	○	○	○	▦	♦	○	○	○	Mx

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Gustafsson 2013[102,232,340–347]	RCT	2007	SWE	all	491	educ & mfa-; educ	ac	–	–	–	–	–	–	–	–	○	○	○	–	○	♦	NC
Hall 1992[103]	RCT	1986	CAN	F	167	hmcr & mfar(w/ slfm)	hmcr & mfar	♦	–	–	–	–	–	♦	–	–	–	–	○	–	♦	?
Harari 2008[104,348–362]	RCT	2000	GBR	all	2503	mfar(w/med)	ac	♦	–	–	–	♦	–	♦	–	–	○	○	–	○	♦	NC
Hattori 2019[105,363]	RCT	2018	JPN	P,F	375	educ & mfar(w/ slfm)	mfar	–	○	–	–	▦	–	–	–	–	○	○	–	–	▦	NC
Hay 1998[106,364]	RCT	< 2006	CAN	U	619	mfa-	ac; ac	♦	–	–	▦	○	–	♦	▦	–	–	–	–	–	♦	NC
Hebert 2001[107]	RCT	< 2006	CAN	P,F	503	mfar(w/med)	ac	♦	–	–	▦	–	–	♦	–	–	–	–	–	–	♦	NC
Henderson 2005[108,365]	cRCT	2002	AUS	R	m:16; 167	mfar	ac	♦	♦	♦	–	♦	–	♦	–	–	▦	♦	–	▦	♦	NC
Hendriksen 1984[109,366–368]	RCT	1980	DNK	all	600	mfar	ac	–	–	–	–	♦	–	▦	–	–	–	–	–	–	♦	NC
Hogg 2009[110,369–373]	RCT	2004	CAN	U	241	mfar(w/med)	ac	–	▦	–	–	▦	–	–	▦	▦	▦	–	–	–	♦	NC
Holland 2005[111,374,375]	RCT	2001	USA	U	504	educ & exrc & mfar(w/slfm)	ac	–	–	?	–	○	–	–	–	–	○	▦	–	–	♦	NC
Howel 2019[112,376–378]	RCT	2011	GBR	all	755	wlfr	ac	–	–	–	–	–	▦	○	▦	▦	▦	▦	–	–	♦	NC
Imhof 2012[113,246]	RCT	2008	CHE	all	461	mfar	ac	♦	○	–	○	▦	○	♦	–	–	–	?	–	○	▦	NC
Jing 2018[114]	RCT	2016	CHN	F	80	psyc; exrc & psyc	–	–	–	–	▦	–	–	–	–	–	▦	▦	▦	–	▦	?

continued

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Jitapunkul 1998[115]	RCT	1993	THA	U	160	rsk-mfa-	ac	–	♦	♦	–	▦	–	–	–	–	–	–	–	▦	▦	NC
Kerse 2014[116,379–383]	cRCT	2008	NZL	P,F	m:60; 3893	rsk-mfa-	ac	♦	▦	–	▦	○	▦	♦	–	–	–	▦	–	–	♦	NC
King 2012[117,384–386]	cRCT	2006	NZL	P,F	m:21; 186	hmcr & ADL & mfar(w/slfm)	hmcr	♦	♦	♦	–	▦	▦	▦	–	–	▦	▦	–	▦	▦	NC
Kono 2016[118,387,388]	RCT	2011	JPN	P	360	mfar(w/med)	mfar	♦	▦	♦	–	♦	–	♦	▦	–	–	♦	–	▦	♦	NC
Kono 2004[119]	RCT	2000	JPN	P,F	119	mfar	ac	♦	○	○	–	–	–	♦	–	–	–	○	–	–	♦	NC
Kono 2012[120,389–391]	RCT	2008	JPN	P	323	mfar	mfar	▦	▦	▦	–	–	–	▦	▦	–	–	▦	–	–	▦	NC
Kukkonen-Harjula 2017[121,392–396]	RCT	2014	FIN	P,F	300	ADL & ntr & exrc	ac	♦	○	–	–	▦	▦	♦	▦	▦	○	○	–	○	♦	NC
Lambotte 2018[122,397–404]	RCT	2017	BEL	P,F	871	mfar	ac	–	–	?	–	○	–	○	–	–	–	–	–	–	–	NC
Leung 2004[123,405]	RCT	2000	HKG	all	260	mfar(w/med)	ac	–	–	–	?	▦	–	○	○	–	–	–	–	–	○	?
Leveille 1998[124,406,407]	RCT	1995	USA	U	201	educ & exrc & mfar(w/ med + slfm)	ac	–	–	▦	–	♦	–	–	▦	–	–	▦	–	–	♦	NC
Lewin 2013[125,408–410]	RCT	2005	AUS	F	750	hmcr & educ & mfar	hmcr	♦	?	?	–	▦	▦	♦	▦	–	–	–	–	–	♦	NC
Liddle 1996[126]	RCT	< 2006	AUS	U	105	aids & mfar	ac	♦	–	▦	–	○	○	♦	–	–	○	–	–	–	▦	NC
Liimatta 2019[127,411–413]	RCT	2013	FIN	R,P	422	exrc & mfa-(w/ med)	ac	–	–	–	–	▦	▦	▦	▦	▦	▦	–	–	–	♦	NC

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Loh 2015[128,414,415]	cRCT	2014	MYS	U	m:8; 256	ntr & exrc	ac	–	–	–	–	–	–	–	–	–	–	○	–	–	–	NC
Lood 2015[129]	RCT	2012	SWE	R,P	40	educ	ac	–	–	–	–	–	–	–	–	–	○	○	?	–	–	NC
Mann J 2021[130,416–420]	cRCT	2018	AUS	all	m:14; 92	mfa-(w/med)	ac	–	–	○	–	▦	–	–	–	○	○	–	–	–	–	NC
Mann WC 1999[131]	RCT	< 2006	USA	F	104	hmcr & aids	hmcr	–	♦	–	–	▦	–	▦	▦	–	–	–	–	–	♦	NC
Markle-Reid 2006[132,421,422]	RCT	2001	CAN	F	288	hmcr & mfar(w/ med + slfm)	hmcr & mfar	–	–	–	–	–	–	–	▦	–	○	▦	–	–	○	NC
Melis 2008[133,423–429]	RCT	2003	NLD	F	155	mfar(w/med)	ac	–	–	–	▦	▦	–	▦	▦	▦	–	▦	–	–	▦	NC
Meng 2005[134,430–436]	RCT	1998	USA	F	1786	educ & vchr & mfar(w/ med + slfm); educ & mfar(w/ med + slfm); vchr	ac	–	▦	▦	–	○	–	–	–	–	▦	–	–	–	♦	NC
Messens 2014[135,437,438]	RCT	2011	EEE	P,F	208	aids & cgn & comm & mntr-mfa-	ac	–	–	–	–	○	–	○	–	–	–	○	–	–	○	NC
Metzelthin 2013[136,245,439–444]	cRCT	2009	NLD	F	m:12; 346	educ & mfar(w/ med + slfm)	ac	♦	♦	♦	▦	▦	▦	♦	▦	▦	▦	♦	–	○	♦	NC
Moll van Charante 2016[137,445–455]	cRCT	2006	NLD	all	m:116; 3526	educ & mfar(w/ slfm)	ac	–	–	–	▦	▦	–	–	–	–	–	▦	–	–	▦	NC

continued

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Monteserin Nadal 2008[138,456]	RCT	2004	ESP	all	620	educ & rsk-mfa-	ac	♦	♦	♦	–	–	▦	♦	–	–	–	○	–	▦	♦	NC
Morey 2006[139,457,458]	RCT	< 2006	USA	all	179	exrc; exrc	exrc	–	–	?	–	–	–	–	–	–	○	–	–	○	–	NC
Morey 2009[140,459–462]	RCT	2004	USA	U	400	exrc	ac	–	–	–	▦	○	–	–	○	–	○	–	–	○	♦	NC
Morgan 2019[141,463–465]	RCT	2014	GBR	P	51	exrc	ac	–	♦	–	–	▦	–	–	–	–	▦	▦	–	–	▦	NC
Newbury 2001[142,466]	RCT	1998	AUS	U	100	mfa-(w/med)	ac	♦	–	♦	–	–	▦	♦	–	–	○	♦	–	▦	♦	NC
Newcomer 2004[143,467,468]	RCT	2001	USA	U	3079	educ & mfar(w/med)	ac	♦	–	–	–	♦	–	♦	▦	–	▦	–	–	–	♦	Mx
Ng 2015[144,469,470]	RCT	2009	SGP	P,F	246	cgn & ntr & exrc	ac	–	–	–	–	♦	–	○	–	–	–	–	–	▦	♦	NC
Parsons J 2012[145,471,472]	cRCT	2007	NZL	P,F	m:?; 205	hmcr & mfar(w/slfm)	hmcr & mfa-	–	–	–	–	–	○	–	–	–	▦	–	–	–	▦	NC
Parsons M 2017[146,473–476]	RCT	2003	NZL	F	113	hmcr & ADL & mfar(w/slfm)	hmcr & mfa-	♦	♦	▦	–	▦	–	▦	▦	▦	▦	♦	–	▦	♦	NC
Parsons M 2012[147,473–476]	cRCT	2003	NZL	F	m:55; 351	hmcr & mfar	hmcr & mfa-	▦	♦	▦	–	▦	–	▦	▦	▦	▦	♦	–	▦	♦	NC
Pathy 1992[148]	RCT	< 2006	GBR	all	725	rsk-mfa-	ac	–	–	–	○	▦	▦	▦	–	–	▦	–	–	–	▦	NC
Phelan 2007[149]	cRCT	2002	USA	all	m:31; 874	mfar(w/med + slfm)	ac	–	–	–	–	♦	–	–	–	–	○	▦	–	–	▦	NC
Ploeg 2010[15,0,477]	RCT	2004	CAN	P,F	719	educ & mfar(w/med)	ac	♦	–	?	–	▦	–	♦	▦	–	▦	–	–	–	♦	NC

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Profener 2016[151,478–480]	RCT	2007	DEU	F	553	educ & mfar	ac	–	–	–	–	–	–	–	–	–	–	–	–	▦	▦	NC
Rockwood 2000[152,481]	RCT	< 2006	CAN	F	182	mfa-(w/med)	ac	▦	♦	♦	–	–	–	▦	–	–	–	–	–	–	♦	NC
Romera-Liebana 2018[153,482,483]	RCT	2013	ESP	P,F	352	cgn & med & ntr & exrc	ac	♦	○	○	–	○	–	♦	–	–	–	–	–	○	♦	NC
Rooijackers 2021[154,484–488]	cRCT	2017	NLD	F	m:10; 264	hmcr & ADL & mfar(w/slfm)	hmcr	♦	♦	♦	▦	–	–	♦	○	○	○	♦	–	▦	♦	NC
Rubenstein 2007[155]	RCT	< 2006	USA	F	792	mfar(w/med)	ac	–	♦	♦	–	♦	–	○	–	–	–	♦	–	▦	♦	NC
Ryvicker 2011[156,489]	cRCT	2005	USA	U	m:45; 3290	hmcr & mfar	hmcr & mfar	–	–	–	–	–	–	–	–	–	–	–	–	–	–	NC
Serra-Prat 2017[157,490]	RCT	2013	ESP	P	172	ntr & exrc	ac	–	–	♦	–	○	–	○	–	–	♦	–	–	▦	♦	NC
Shapiro 2002[158]	RCT	1998	USA	F	108	hmcr & mfar	ac	♦	–	–	–	–	–	♦	○	–	–	?	–	–	♦	NC
Sherman 2016[159,491]	cRCT	2006	SWE	all	m:16; 583	mfa-(w/med)	ac	–	–	–	?	–	–	–	–	–	?	–	▦	–	–	NC
Siemonsma 2018[160,492,493]	RCT	2009	NLD	F	155	ADL	mfa-	–	–	–	▦	–	–	–	–	–	▦	–	–	○	♦	NC
Stewart 2005[161,494,495]	RCT	2000	GBR	P,F	321	mfa-	mfa-	–	–	▦	–	–	–	–	▦	▦	▦	–	–	–	▦	NC
Stuck 1995[162,496–500]	RCT	1988	USA	all	414	educ & mfar(w/med)	ac	♦	♦	♦	▦	▦	–	♦	–	–	○	○	–	○	▦	NC

continued

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Stuck 2000[163,501–504]	RCT	1993	CHE	all	791	mfar(w/med)	ac	–	–	○	–	○	–	▦	▦	–	○	○	–	–	▦	NC
Stuck 2015[164,359–362,505]	RCT	2000	CHE	R,P	2284	educ & mfar(w/med + slfm)	ac	♦	–	–	–	○	–	♦	○	–	○	○	–	○	▦	NC
Suijker 2016[165,506–511]	cRCT	2010	NLD	F	m:24; 2283	mfar(w/med)	ac	♦	○	○	▦	▦	–	♦	▦	▦	▦	–	–	▦	♦	NC
Szanton 2011[166,512,513]	RCT	2010	USA	P,F	40	ADL & aids & educ & exrc & mfar(w/med + slfm)	ac	♦	♦	♦	–	–	–	♦	–	–	▦	–	–	–	▦	NC
Szanton 2019[167,512,514–523]	RCT	2012	USA	P,F	300	ADL & aids & educ & exrc & mfar(w/med + slfm)	ac	–	♦	♦	–	–	–	–	○	–	♦	♦	–	–	♦	NC
Takahashi 2012[168,524–530]	RCT	2009	USA	F	205	mntr-mfa-	ac	–	–	♦	–	♦	–	–	○	–	♦	♦	–	–	♦	Mx
Teut 2013[169,531]	cRCT	2009	DEU	F	m:8; 58	hmcr & hmnt & exrc	hmcr	–	○	♦	–	▦	–	–	–	–	–	♦	–	–	♦	Mx
Thiel 2019[170,532,533]	RCT	2017	DEU	F	?	exrc & mfar(w/med)	ac	–	–	–	–	○	–	–	–	–	○	○	–	○	–	NC
Thomas 2007[171]	RCT	2001	CAN	P,F	520	mfar(w/med); mfar(w/med)	ac	–	–	–	–	–	▦	♦	–	–	♦	–	–	–	○	?
Tomita 2007[172]	RCT	< 2006	USA	F	124	aids	ac	♦	♦	○	–	○	○	♦	–	–	–	–	–	–	▦	NC
Tulloch 1979[173]	RCT	1972	GBR	all	339	mfar(w/med)	ac	♦	–	–	–	▦	–	♦	–	–	–	–	–	–	▦	?
Tuntland 2015[174,534–536]	RCT	2012	NOR	U	61	hmcr & ADL & aids & mfa-(w/slfm)	hmcr & mfa-	–	–	–	–	–	–	–	▦	▦	▦	–	–	–	▦	NC

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
van der Pols-Vijlbrief 2017[175,537]	RCT	2013	NLD	F	155	hmcr & ntr & mfar	hmcr	–	–	▦	–	–	–	–	▦	▦	▦	–	–	–	▦	NC
van Dongen 2020[176,538–541]	RCT	2016	NLD	all	168	ntr & exrc	ac	–	–	–	–	▦	–	–	○	○	▦	–	–	–	–	Mx
van Heuvelen 2005[177,542]	RCT	2001	NLD	P,F	233	exrc & psyc	ac	–	♦	♦	–	–	–	–	–	–	–	♦	–	–	–	NC
van Hout 2010[178,543,544]	RCT	2002	NLD	F	658	mfar(w/med)	ac	♦	–	–	▦	♦	–	♦	○	–	▦	○	–	–	♦	NC
van Leeuwen 2015[179,545–549]	cRCT	2010	NLD	F	m:35; 1147	mfar(w/ med + slfm)	ac	–	○	○	–	○	–	–	○	○	○	○	–	–	○	NC
van Lieshout 2018[180,550]	RCT	2011	NLD	P,F	710	ADL & med & ntr & sst	ac	–	–	–	–	♦	–	–	–	–	▦	–	–	–	–	NC
van Rossum 1993[181,551,552]	RCT	1988	NLD	all	580	mfar	ac	–	?	?	–	♦	–	▦	▦	–	▦	–	▦	–	♦	NC
Vass 2005[182,553–573]	cRCT	1999	DNK	all	m:34; 4060	mfar(w/med)	mfar	–	–	–	–	▦	○	○	▦	▦	–	–	–	–	♦	NC
Vetter 1984[183]	RCT	1980	GBR	all	1148	mfar	ac	–	–	–	○	–	○	–	–	–	–	○	–	–	▦	NC
von Bonsdorff 2008[184,574–579]	RCT	2003	FIN	R	632	exrc	ac	–	▦	?	–	○	▦	○	–	–	○	○	?	–	▦	NC
Wallace 1998[185,407]	RCT	< 2006	USA	all	100	exrc & mfar	ac	–	–	–	–	–	–	–	–	–	–	▦	–	–	–	NC
Walters 2017[186,580,581]	RCT	2015	GBR	P	51	mfar(w/slfm)	ac	–	–	♦	–	–	–	–	▦	–	▦	▦	–	▦	–	NC
Whitehead 2016[187,582,583]	RCT	2014	GBR	F	30	hmcr & ADL & aids & mfa-	hmcr & mfa-	○	▦	▦	–	▦	▦	▦	○	–	▦	–	–	▦	▦	NC

continued

TABLE 3 Summary characteristics of included studies (*continued*)

Study	Design	Enrolment began	Country	Population frailty	Enrolled	Interventions	Controls	Living at home	IADL	PADL	PADL & IADL	Hospitalisation	Homecare	Care-home placement	Cost	Cost-effectiveness	Health status	Depression	Loneliness	Falls	Mortality	Funding
Williams 1992[188,584]	RCT	< 2006	GBR	all	470	mfar	mfa-	–	–	–	▦	–	–	–	–	–	–	–	–	–	♦	NC
Wolter 2013[189,585–587]	cRCT	2007	DEU	F	m:69; 920	hmcr & mfar(w/ med)	hmcr	♦	♦	▦	–	▦	–	♦	–	–	▦	–	–	–	♦	NC
Wong 2019[190,588–591]	RCT	2016	HKG	all	540	mfar(w/slfm)	ac	♦	?	○	–	▦	–	♦	▦	▦	▦	○	–	–	▦	NC
Yamada 2003[191]	RCT	1999	JPN	P,F	368	mfar(w/med)	ac	–	○	–	–	○	–	–	–	–	▦	–	–	–	♦	NC

Intervention and control group abbreviations are a combination of the following: ac, available care; ADL, activities of daily living training; aids, provision of aids and adaptions; cgn, cognitive training; comm, technology for communication and engagement; educ, health education; eng, engagement in meaningful-activities; exrc, physical exercise; hmcr, formal homecare; hmnt, alternative medicine such as homeopathy and naturopathy; med, medication-review; mfa, multifactorial-action; mfar, multifactorial-action and follow-on routine review; mntr-mfa, monitoring, which may trigger multifactorial-action; ntr, nutritional support; psyc, psychological therapy; rsk-mfa, risk-screening, which may trigger multifactorial-action; sst, social skills training; vchr, care voucher provision; wlfr, welfare rights advice; w/med, with medication-review; w/slfm, with self-management. See *Interventions and comparators*, for further information.

Notes

Note that some reports provide information about multiple studies and are therefore cited more than once.

Countries, territories or areas of geographical interest, are indicated with ISO 3166-1 alpha-3 codes, except EEE to indicate a study in multiple European countries: AUS, Australia; BEL, Belgium; CAN, Canada; CHE, Switzerland; CHN, China; DEU, Germany; DNK, Denmark; ESP, Spain; FIN, Finland; FRA, France; GBR, United Kingdom; HKG, Hong Kong; ITA, Italy; JPN, Japan; MYS, Malaysia; NLD, the Netherlands; NOR, Norway; NZL, New Zealand; SGP, Singapore; SWE, Sweden; THA, Thailand; USA, United States of America.

all, All frailty groups; R, robust; P, pre-frail; F, frail; U, unclassified.

m indicates the number of clusters assigned for cRCTs.

Outcomes: ♦, included in NMA; ▦, included in table;?, only a bespoke outcome was used; ○, insufficient data to include; –, not reported as being measured. IADL, instrumental activities of daily living; PADL, personal activities of daily living.

Funding: C, commercial; Mx, mixed; NC, non-commercial; ?, unclear.

1998[106] and Liddle 1996[126] identified participants with problems who were subsequently randomised but also reported on the non-randomised group without identified problems, which were excluded from this review. Similarly, Blom 2016[70] was a cRCT in which GPs were randomised and only a random subset of the participants with complex problems were intended to receive the intervention. However, they also described the participants without complex problems. Therefore, there were groups without complex problems in each arm and a group with complex problems in the intervention arm who were not individually randomised to receive the intervention, which were excluded from analyses in this review.

Kukkonen-Harjula 2017[121] was effectively two parallel RCTs with the same intervention and control groups, one included older people with frailty and the other included older people with recent hip fracture. We only included the trial that recruited older people with frailty.

Seven intervention arms in four studies were excluded from this review because they were considered a single-component intervention: exercise referral scheme in Giné-Garriga 2020;[98] Baduanjin training in Jing 2018;[114] three arms of Ng 2015[144] (nutrition supplementation, physical training and cognitive training); and two arms in van Heuvelen 2005[177] (physical activity and psychological training).

Phelan 2007[149] was a cRCT in which those recruited first were treated differently. In the intervention arm, participants received assessment and follow-up with geriatric specialists who liaised with their primary care provider, while the control group received usual care. Participants recruited subsequently in the intervention arm only saw the geriatric specialists at request of the primary care provider, with the intention that the interactions regarding those recruited first would improve the primary care provider's management of subsequent participants. We treated this latter group as an evaluation of staff education and excluded their results from this review.

Vetter 1984[183] randomised participants to a visit by a health visitor, usual care or a third, smaller arm who received a questionnaire. No details were provided on whether the results of the questionnaire would be acted upon and no results were provided for this arm. Therefore, we exclude this arm as having insufficient information.

Interventions and comparators

There were 266 eligible intervention arms within the 129 included studies. These are detailed in relation to the TIDieR items in *Report Supplementary Material 3* and referenced in the characteristics of included studies (see *Report Supplementary Material 1*); ineligible intervention arms are described in Excluded groups within included studies. One hundred and twenty-two studies had two eligible intervention arms, 120 of which compared one experimental intervention with one control intervention. Two studies compared two eligible experimental interventions only.[90,114] Six studies had three eligible intervention arms, in three of which there were two experimental interventions and one control intervention,[69,102,171] while the other three included one experimental intervention and two control interventions.[79,106,139] One study had four eligible intervention arms, three of which were experimental.[134]

Most of the interventions were delivered at the participant's residence via trained personnel or homecare services; others were delivered in a primary care setting such as a general practice centre, or in leisure or community centres.

Components

We identified 19 separate components that were intended to be delivered to all participants among the 266 interventions. With our PPI group we developed public-facing names and plain language descriptions for these components, and organised them into domains (see *Appendix 2*). Fourteen components were 'action' components (e.g. therapy, support, education) and the remaining five components involved some kind of ascertainment or assessment process with the potential to lead to multiple actions.

The 14 action components, their short (in bold) and abbreviated labels were:

- formal **homecare** (hmcr, identified in 41 interventions)
- physical **exercise** (exrc, 30 interventions)
- health **education** (educ, 26 interventions)
- **ADL** training (ADL, 13 interventions)
- providing **aids** and adaptations (aids, 12 interventions)
- **nutrition**al support (ntr, 10 interventions)
- psychological (mood) therapy (**psychology**, psyc, 4 interventions)
- technology for communication and engagement (**telecoms**, comm, 4 interventions)
- **cognitive training** (cgn, 3 interventions)
- engagement in **meaningful-activities** (eng, 3 interventions)
- **care voucher** provision (vchr, 2 interventions)
- **alternative medicine** such as homeopathy and naturopathy (hmnt, 1 intervention)
- **social skills** training (sst, 1 intervention) and
- **welfare** rights advice (wlfr, 1 intervention).

Homecare involved frequent visits at home by health or care professionals to provide services including support with household tasks, self-care and nursing care. Formal homecare was a component of usual care intended to be received by all participants in 40 of the interventions and any other components typically interacted, or were integrated, with it. In the remaining intervention, formal homecare was part of the programme of 'early' interventive social services for older people moderately at risk of becoming unable to remain in their own homes.[158]

The five components involving a process of ascertainment or assessment were:

- **multifactorial-action** from care planning (mfa, 117 interventions)
- routine follow-up **review** (following multifactorial-action from care planning; mfar, 82 interventions)
- **medication-review** (med, 4 interventions)
- **monitoring** (mntr-mfa-, 2 interventions) and
- routine **risk-screening** (rsk-mfa-; 7 interventions).

Multifactorial-action from care planning is the term we gave to a process of individualised multidomain assessment and management intended to lead to subsequent action, where the components of action are tailored to the individual. This did not apply to interventions where the subsequent action was intended to relate to one component only.

Routine review is a process of scheduled, regular follow-ups that follow on from multifactorial-action. This does not include additional contacts that were ad hoc or determined by need. We labelled the remaining 35 interventions with mfa- to denote the absence of routine review (although not necessarily further contact).

Because multifactorial-action encompassed a broad range of approaches and differing patterns of follow-on action, we sought meaningful and identifiable criteria by which to further delineate it. Based on discussion with experts, we identified **medication-review** (w/med; 54 interventions), and specific psychological strategies to support behaviour change and **self-management** (w/slfm; 29 interventions) in the assessment and care planning of multifactorial-action, including their combination and absence. The specific self-management strategies included reframing, motivational interviewing, problem-solving, goal setting and action planning,[592] but not practical support with adherence (e.g. encouragement phone calls, prompts and reminders), or general comments about encouragement of behaviour change or self-management. This helped to characterise approaches to multifactorial-action that incorporated medical and psychosocial orientations.

We treated medication-review as a component in its own right when present in an intervention that did not include multifactorial-action.

Monitoring and routine risk-screening are two components where participants only receive multifactorial-action from care planning when they meet a particular trigger or threshold. We did not treat risk-screening as an intervention component where it was used solely to identify those eligible for the trial.

Available care was the label we applied to interventions (or conditions) where there was no particular component intended to be delivered to all participants. This acknowledged the availability of a wide range of primary, secondary, tertiary and wider community services that would be accessed by some, but not all, participants without specifying their nature. We also included here actions that were not intended or anticipated to affect an individual's independence such as attention control, placebo and other minor actions such as giving a leaflet. Additionally, we did not identify trial-specific procedures related with data collection, or safeguarding such as suicide monitoring, as separate components.

Intervention groups

Our intervention groups were formed from the 63 combinations of these components among the 266 interventions, as detailed in *Table 4*. The largest group is ac (comprised of 98 interventions). Other groups including more than 10 interventions are multifactorial-action and review with medication-review (24 interventions), multifactorial-action and review (15 interventions) and homecare (12 interventions). Eight groups contained two interventions while 37 groups were formed of one intervention only. We have provided TIDieR summaries of the 26 intervention groups with more than 1 intervention in *Report Supplementary Material 4*.

Usual care, the standard care provided in that context in the absence of a trial, was often ac or homecare but in some contexts it was multifactorial-action; multifactorial-action and review; aids; or another intervention. Not all trials included a usual care comparator.

Comparisons

The 144 within-trial comparisons between eligible arms formed 80 types of direct comparison (edges or links) between the intervention groups (nodes or points; illustrated in *Figure 2*). There were 20 comparisons of multifactorial-action and review with medication-review versus ac, 8 comparisons of multifactorial-action and review versus ac and 6 comparisons of risk-screening versus ac. Sixty-one edges were formed of a single within-trial comparison.

Most of the edges had ac as one of their nodes (n = 45). Nine of the edges had formal homecare as one of their nodes. Forty-three nodes were only connected by one edge to the rest of the network, 34 of which were only connected by a single trial's comparison.

The nodes and edges formed one connected network in principle. However, single studies linked different parts of the network, thus lack of data meant the network was divided in many analyses into two networks: one network of comparisons with ac and one network of comparisons with homecare (hmcr). Additionally, among the nodes with homecare as a component, there were multiple comparisons on the path between the homecare node and the homecare, multifactorial-action and review node, which was connected to ac. This meant there were some analyses where some nodes that included homecare as a component were connected to the ac network but still disconnected from the homecare network.

Nine comparisons formed self-loops, where we had categorised two or more arms of a trial into the same intervention group. These comparisons, therefore, do not form part of the network for meta-analysis. Three of these were in three-arm trials, with a pair of comparisons that still contributed to the analysis.[69,106,171] Morey 2006[139] was a three-arm trial that did not report any results of interest

TABLE 4 Intervention groups, the components they comprise and the number of interventions included in the group

Intervention group label	Abbreviated label	Interventions	hmcr	ADL	aids	cgn	comm	educ	eng	exrc	hmnt	ntr	psyc	sst	vchr	wlfr	mfa	mfar	w/med[a]	w/slfm[a]	med	mntr	rsk
ADL	ADL	2		●																			
ADL and exercise	ADL & exrc	1		●						●													
ADL, aids and exercise	ADL & aids & exrc	1		●	●					●													
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management	ADL & aids & educ & exrc & mfar(w/ med + slfm)	2		●	●			●		●							●	●	●	●			
ADL, medication-review, nutrition and social skills	ADL & med & ntr & sst	1		●								●		●							●		
ADL, nutrition and exercise	ADL & ntr & exrc	1		●						●		●											
Aids	aids	2			●																		
Aids, cognitive training, telecoms and monitoring	aids & cgn & comm & mntr-mfa-	1			●	●	●															●	
Aids, education and telecoms	aids & educ & comm	1			●		●	●															
Aids, multifactorial-action and review	aids & mfar	1			●												●	●					
Available care	ac	98																					
Care voucher	vchr	1													●								
Care voucher, education, multifactorial-action and review with medication-review and self-management	educ & vchr & mfar(w/ med + slfm)	1						●							●		●	●	●	●			

TABLE 4 Intervention groups, the components they comprise and the number of interventions included in the group (*continued*)

Intervention group label	Abbreviated label	Interventions	hmcr	ADL	aids	cgn	comm	educ	eng	exrc	hmnt	ntr	psyc	sst	vchr	wlfr	mfa	mfar	w/med[a]	w/slfm[a]	med	muntr	rsk
Cognitive training, medication-review, nutrition and exercise	cgn & med & ntr & exrc	1				•				•		•									•		
Cognitive training, nutrition and exercise	cgn & ntr & exrc	1				•				•		•											
Education	educ	3						•															
Education and multifactorial-action	educ & mfa-	1						•									•						
Education and risk-screening	educ & rsk-mfa-	1						•															•
Education, exercise, multifactorial-action and review with medication-review and self-management	educ & exrc & mfar(w/ med + slfm)	2						•		•							•	•	•	•			
Education, exercise, multifactorial-action and review with self-management	educ & exrc & mfar(w/slfm)	1						•		•							•	•		•			
Education, multifactorial-action and review	educ & mfar	1						•									•	•					
Education, multifactorial-action and review with medication-review	educ & mfar(w/ med)	3						•									•	•	•				
Education, multifactorial-action and review with medication-review and self-management	educ & mfar(w/ med + slfm)	5						•									•	•	•	•			

continued

TABLE 4 Intervention groups, the components they comprise and the number of interventions included in the group (*continued*)

Intervention group label	Abbreviated label	Interventions	hmcr	ADL	aids	cgn	comm	educ	eng	exrc	hmnt	ntr	psyc	sst	vchr	wlfr	mfa	mfar	w/med[a]	w/slfm[a]	med	mntr	rsk
Education, multifactorial-action and review with self-management	educ & mfar(w/slfm)	2						●									●	●		●			
Exercise	exrc	7								●													
Exercise and multifactorial-action with medication-review	exrc & mfa-(w/med)	1								●							●		●				
Exercise and multifactorial-action with medication-review and self-management	exrc & mfa-(w/med + slfm)	1								●							●		●	●			
Exercise and psychology	exrc & psyc	3								●			●										
Exercise, multifactorial-action and review	exrc & mfar	1								●							●	●					
Exercise, multifactorial-action and review with medication-review	exrc & mfar(w/med)	1								●							●	●	●				
Exercise, multifactorial-action and review with medication-review and self-management	exrc & mfar(w/med + slfm)	1								●							●	●	●	●			
Homecare	hmcr	12	●																				
Homecare and aids	hmcr & aids	1	●		●																		
Homecare and medication-review	hmcr & med	1	●																		●		
Homecare and multifactorial-action	hmcr & mfa-	5	●														●						
Homecare and nutrition	hmcr & ntr	1	●									●											

TABLE 4 Intervention groups, the components they comprise and the number of interventions included in the group (*continued*)

Intervention group label	Abbreviated label	Interventions	hmcr	ADL	aids	cgn	comm	educ	eng	exrc	hmnt	ntr	psyc	sst	vchr	wlfr	mfa	mfar	w/med[a]	w/slfm[a]	med	muntr	rsk
Homecare, ADL, aids and multifactorial-action	hmcr & ADL & aids & mfa-	1	●	●	●												●						
Homecare, ADL, aids and multifactorial-action with self-management	hmcr & ADL & aids & mfa-(w/slfm)	1	●	●	●												●			●			
Homecare, ADL, multifactorial-action and review with self-management	hmcr & ADL & mfar(w/slfm)	3	●	●													●	●		●			
Homecare, aids and telecoms	hmcr & aids & comm	1	●		●		●																
Homecare, alternative-medicine and exercise	hmcr & hmnt & exrc	1	●							●	●												
Homecare, education, multifactorial-action and review	hmcr & educ & mfar	1	●					●									●	●					
Homecare, multifactorial-action and review	hmcr & mfar	6	●														●	●					
Homecare, multifactorial-action and review with medication-review	hmcr & mfar(w/med)	3	●														●	●	●				
Homecare, multifactorial-action and review with medication-review and self-management	hmcr & mfar(w/med + slfm)	1	●														●	●	●	●			
Homecare, multifactorial-action and review with self-management	hmcr & mfar(w/slfm)	2	●														●	●		●			

continued

TABLE 4 Intervention groups, the components they comprise and the number of interventions included in the group (*continued*)

Intervention group label	Abbreviated label	Interventions	hmcr	ADL	aids	cgn	comm	educ	eng	exrc	hmnt	ntr	psyc	sst	vchr	wlfr	mfa	mfar	w/med[a]	w/slfm[a]	med	mntr	rsk
Homecare, nutrition, multifactorial-action and review	hmcr & ntr & mfar	1	●									●					●	●					
Meaningful-activities and education	eng & educ	2						●	●														
Meaningful-activities and multifactorial-action with self-management	eng & mfa-(w/slfm)	1							●								●			●			
Medication-review, nutrition and exercise	med & ntr & exrc	1								●		●									●		
Monitoring	mntr-mfa-	1																				●	
Multifactorial-action	mfa-	9															●						
Multifactorial-action and review	mfar	15															●	●					
Multifactorial-action and review with medication-review	mfar(w/med)	24															●	●	●				
Multifactorial-action and review with medication-review and self-management	mfar(w/med + slfm)	3															●	●	●	●			
Multifactorial-action and review with self-management	mfar(w/slfm)	2															●	●		●			
Multifactorial-action with medication-review	mfa-(w/med)	5															●		●				
Multifactorial-action with medication-review and self-management	mfa-(w/med + slfm)	1															●		●	●			

TABLE 4 Intervention groups, the components they comprise and the number of interventions included in the group (*continued*)

Intervention group label	Abbreviated label	Interventions	hmcr	ADL	aids	cgn	comm	educ	eng	exrc	hmnt	ntr	psyc	sst	vchr	wlfr	mfa	mfar	w/med[a]	w/slfm[a]	med	mntr	rsk
Nutrition and exercise	ntr & exrc	3								•		•											
Psychology	psyc	1											•										
Risk-screening	rsk-mfa-	6																					•
Telecoms	comm	1					•																
Welfare-advice	wlfr	1														•							

ADL, activities of daily living training; aids, provision of aids and adaptions; cgn, cognitive training; comm, technology for communication and engagement; educ, education; eng, engagement in meaningful-activities; exrc, exercise; hmcr, homecare; hmnt, alternative medicine such as homeopathy and naturopathy; med, medication-review; mfa, multifactorial-action; mfar, multifactorial-action and follow-on routine review; mntr-mfa, monitoring, which may trigger multifactorial-action; ntr, nutritional support; psyc, psychological therapy; rsk-mfa, risk-screening, which may trigger multifactorial-action; sst, social skills training; vchr, care voucher provision; wlfr, welfare rights advice; w/med, with medication-review; w/slfm, with self-management.

a Not a component but an aspect of multifactorial-action from care planning.

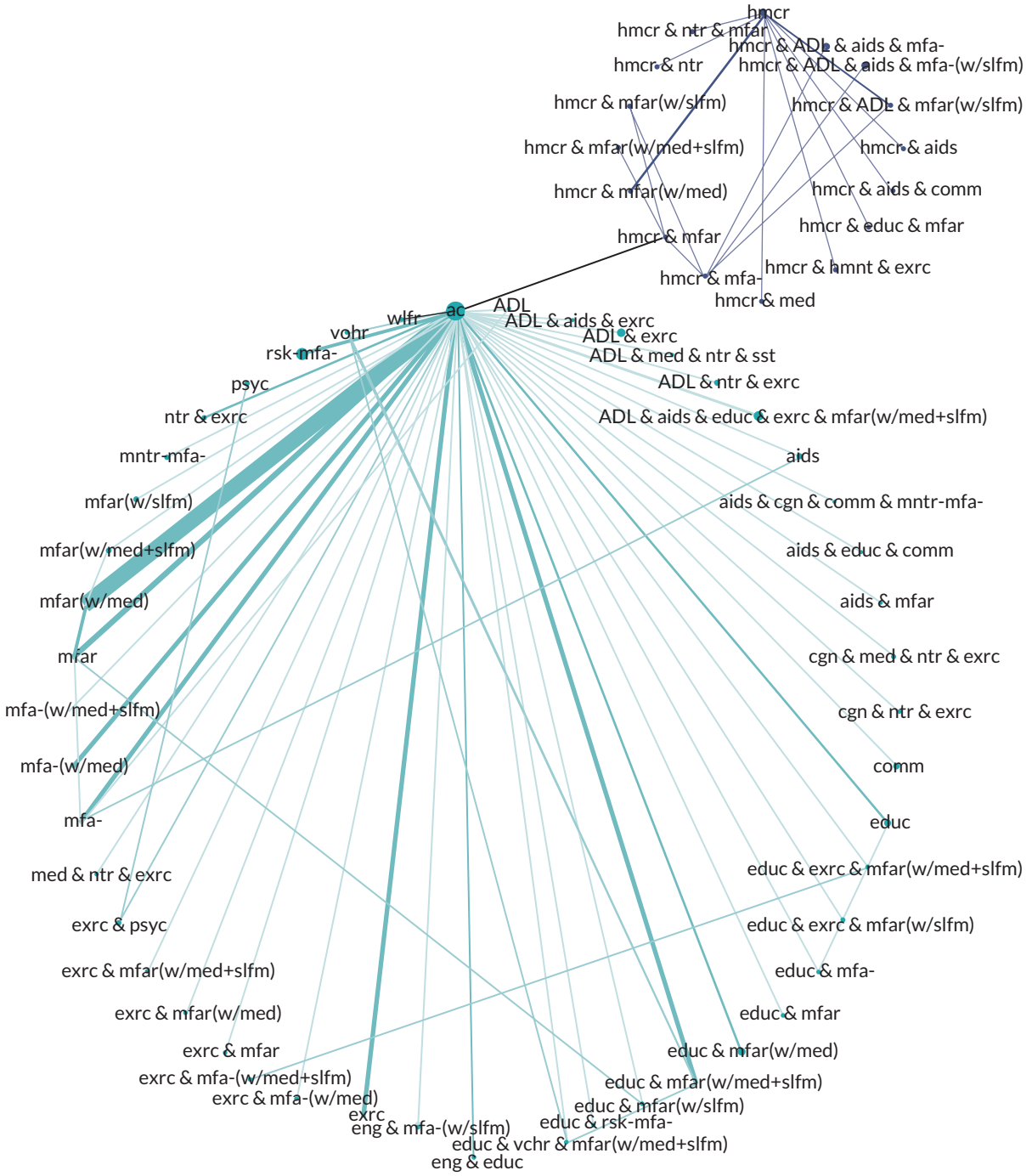


FIGURE 2 Network of 63 intervention groups (nodes) and the 80 types of direct comparison (edges) included in the review (all included studies regardless of availability of results data). ADL, activities of daily living training; aids, provision of aids and adaptions; cgn, cognitive training; comm, technology for communication and engagement; educ, education; eng, engagement in meaningful-activities; exrc, exercise; hmcr, homecare; hmnt, alternative medicine such as homeopathy and naturopathy; med, medication-review; mfa, multifactorial-action; mfar, multifactorial-action routine review follow on; mntr-mfa, monitoring, which may trigger multifactorial-action; ntr, nutritional support; psyc, psychological therapy; rsk-mfa, risk-screening, which may trigger multifactorial-action; sst, social skills training; vchr, care voucher provision; wlfr, welfare rights advice; w/med, with medication-review; w/slfm, with self-management.

where we categorised all three interventions in the same group; all three arms featured a minimal but active intervention, one was a high-intensity alternative and one added an attention control element. The remaining three self-comparisons all included multifactorial-action as a component. Kono 2012[120] compared two forms of multifactorial-action and review. Stewart 2005[161] compared multifactorial-action from care planning performed by either a social worker or an occupational therapist. Ryvicker 2011[156] compared two forms of homecare, multifactorial-action and review.

Outcomes

Instrumental activities of daily living (IADL) outcomes were measured by 51 studies, 38 of which reported results of interest. Personal activities of daily living (PADL) outcomes were measured by 65 studies, 46 of which reported results of interest. Combined PADL and IADL outcomes were measured by 31 studies, 22 of which reported results of interest. Hospitalisation outcomes were measured by 78 studies, 57 of which reported results of interest but only 35 of which reported number of participants hospitalised. Homecare usage was measured by 24 studies but reported by 16. Care-home placement was measured in some form by 71 studies, 55 of which reported results of interest, and 42 of which included a measure of current care-home placement. Health status was measured by 77 studies, 47 of which reported results of interest. Depression outcomes were measured by 72 studies, 41 of which reported results of interest. Loneliness was measured by 12 studies but reported by 6 of them. Falls were measured by 40 studies but reported by 23, 19 of which included a measure of the number of participants who fell. Finally, mortality was reported by 98 studies, often as part of accounting for losses to follow-up.

Follow-up was between 24 weeks[166,176] and 8 years.[164] Twenty-seven studies only completed follow-up during the short-term time frame (ignoring any crossover periods), 54 studies completed final follow-up in the medium-term time frame and 48 extended into the long-term time frame.

Funding and conflicts of interest

One hundred and sixteen studies had non-commercial funding, six had both non-commercial and commercial sources of funding (mixed) and funding sources were unclear for seven studies. The authors of 71 studies declared no conflicts of interest without caveats. We did not identify any statement regarding conflicts of interest for 39 studies. Some study authors declared interests including personal ownership of the intervention's intellectual property and the possibility of commercially exploiting this. Other declarations included funding or donations from an intervention developer. See the characteristics of included studies table in *Report Supplementary Material 1* for further details.

Risk of bias

We assessed RoB in results of interest, which were available from 113 studies. Although we assessed RoB for each result of interest, the judgements were the same across results per study in the domains related to allocation and deviations from the intended intervention for all but four studies (described below). Therefore, we have summarised the RoB in these domains here on a per-study basis (see *Figure 3*).

Individually randomised studies

Risk of bias due to the randomisation process (individual)

Among individually randomised studies, we judged the randomisation process to present a low RoB for 36 studies, some concerns for 51 studies and a high risk in 7 studies. Of those at high RoB, we were concerned that allocation was predictable in three due to small-block randomisation,[63,79,190] the process was reported to have been subverted in two,[66,125] there was unexplained imbalance in baseline characteristics in one[172] and participants were allocated prior to recruitment in one.[95]

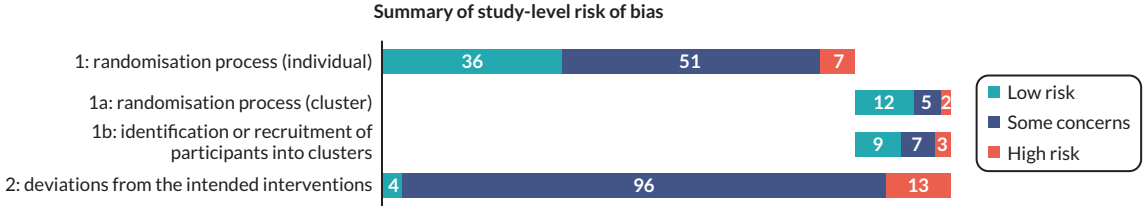


FIGURE 3 Summary of study-level RoB for the domains related to allocation and deviations from the intended intervention in the 113 studies with results of interest. Four studies had results at differing RoB in domain 2, so we have used the highest risk in this figure.

Risk of bias due to deviations from the intended interventions

We judged the RoB due to deviations from the intended interventions to present some concerns in 80 individually randomised studies. Two studies were judged to have low RoB because they investigated whether the control group had deviated from their assigned intervention due to the trial context. Twelve studies presented a high RoB in this domain for at least one result: six due to post-randomisation exclusions,[63,106,124,134,158,177] four due to risk or detection of contamination,[67,104,126,164] one due to a combined risk of contamination and the reassignment of intervention participants to control following non-engagement[125] and one due to substantial modifications in the intervention from what was originally intended.[66]

Four of the studies with results at high RoB due to post-randomisation exclusions also reported results for other outcomes for which participants were not excluded, where we could incorporate those excluded in the analysis, or where the number of exclusions was too small to substantially affect the results.[106,124,134,158]

Cluster-randomised studies

Risk of bias due to the randomisation process (cluster)

We judged the randomisation process in cluster-randomised trials to present low RoB in 12 studies, some concerns in 5 studies and high RoB in 2 studies. We judged that there was a high RoB in the randomisation process of Bleijenberg 2016[69] because, despite reportedly being computer-randomised from a complete list stratified by cluster size, there was a substantial and unexplained imbalance in cluster size, education level and socioeconomic status. We reached the same judgement for Blom 2016,[70] where the cluster-randomisation process and an additional individual randomisation within the intervention arm were not detailed and there was also substantial and unexplained imbalance in cluster size.

Risk of bias due to identification or recruitment of participants into clusters

We judged the identification or recruitment of participants into clusters to present low RoB in nine studies, some concerns in seven studies and high RoB in three studies. In the three studies at high RoB, participant recruitment took place after cluster allocation; in two studies the recruiters and participants appeared to know the allocation prior to recruitment,[108,149] while in Parsons J 2012[145] this was unclear and we were concerned by imbalances in participant characteristics.

Risk of bias due to deviations from the intended interventions

We judged the RoB due to deviations from the intended interventions to present low RoB in 2 studies, some concerns in 16 studies and high RoB in 1 study. In the studies at low RoB, it seemed unlikely that there were deviations due to the trial context despite awareness of the intervention.[108,130] Sherman 2016[159] was at high risk in this domain because participants who did not receive the intervention were excluded from the analysis.

Risk of bias in results of interest

Risks of bias arising in the other domains varied according to the outcome assessed. For missing outcome data, differences particularly related to whether the outcome was continuous or dichotomous and the proportion of people experiencing the event, with rare, dichotomous outcomes more likely to be at higher risk. For bias in measurement of the outcome, differences largely related to whether the outcome was self-reported or sourced from records and whether the self-reporting was about the individual's perception (such as depressive symptoms) or memorable, observable events (such as hospitalisation). For bias in selection of the reported result, we very rarely had access to a sufficiently detailed analysis plan, so differences largely related to whether we had access to numbers of events and cases where there were no plausible alternative definitions for the measure such that the same data could be recut into different groups such as mortality as a defined outcome.

Overall risk of bias

Overall, no results of interest were judged to have low RoB; there were some concerns about 28%, with the remaining 72% at high RoB. We further judged those results at high RoB to present either serious concerns (53% of results) or very serious concerns (19% of results). Because there were differences in RoB by outcome, some outcomes were reported by more studies, and different studies report different outcomes, we have not presented a more detailed breakdown here. The RoBs are summarised for each analysis in the text and details are provided in *Report Supplementary Material 10*. Results were included in analyses regardless of RoB, but we conducted sensitivity analyses excluding results for which we had very serious concerns. We judged whether to downgrade our certainty in the evidence for an effect estimate based on the contributions of results judged as serious concerns or very serious concerns about RoB.

Chapter 4 Results of syntheses

This chapter presents the results of syntheses for clinical and service outcomes; economic evidence is presented in *Chapter 5*. NMAs were conducted for living at home, IADL, PADL and care-home placement outcomes for three time frames and for hospitalisation, health status, depression and mortality for the medium-term time frame only. Homecare services usage, loneliness and falls were narratively synthesised. Sensitivity analyses and investigation of frailty were only conducted for the medium-term time frame. As described in *Interventions and comparators* in *Chapter 3*, the network of comparisons available for analysis was split in two for all outcomes except mortality. Therefore, we present two analyses for all other outcomes and time frames (where possible), one with ac as the reference comparator (ac network) and one with homecare as the reference comparator (homecare network).

The reports of the main results of an analysis present comparisons with the reference comparator that are ordered by certainty first (high to low) and ranking second (first to last). Textual summaries of results indicate uncertainty using the terms 'probably' or 'may', and effect size as described in *Confidence in cumulative evidence* in *Chapter 2*. Results with very low certainty are not summarised in the text but are provided in summary of findings tables.

Characteristics of studies included in each NMA and results are presented in *Report Supplementary Material 5*. Estimates of the effectiveness of intervention groups for community-based complex interventions are presented in network tables, with direct evidence for pairwise comparisons listed in the upper right triangle of each table and NMA pooled effect estimates listed in the lower left triangle of each table. Most of the networks were small and sparsely connected. Therefore, conclusions regarding comparative intervention effectiveness should be interpreted cautiously, also considering the uncertainty expressed by 95% CIs. The GRADE rating of certainty accounts for uncertainty expressed by the CI as well as other factors such as RoB. The mean rank, 95% CI for the true rank and SUCRA values for intervention groups included across the networks are presented in the rankings table. It should be noted that intervention group rankings are based on intervention group effectiveness (SMDs/ORs) and as such can be susceptible to change if an intervention group is added or removed from small networks.

Additional results not included in NMA are tabulated in *Report Supplementary Material 9*; RoB judgements for all results are presented in *Report Supplementary Material 10*.

The following sections describe the results of our analyses for each outcome of interest.

Living at home

Living at home is defined either as a reported trial outcome or the inverse of care-home placement and mortality if reported separately. OR was estimated in the NMA to compare the odds of living at home between two arms. OR > 1 means that the estimated effect favours the experimental intervention group, that is an increased chance of living at home with the intervention. For each time frame, there were two separate networks, one with ac reference comparator and another with homecare comparator, which we describe in turn.

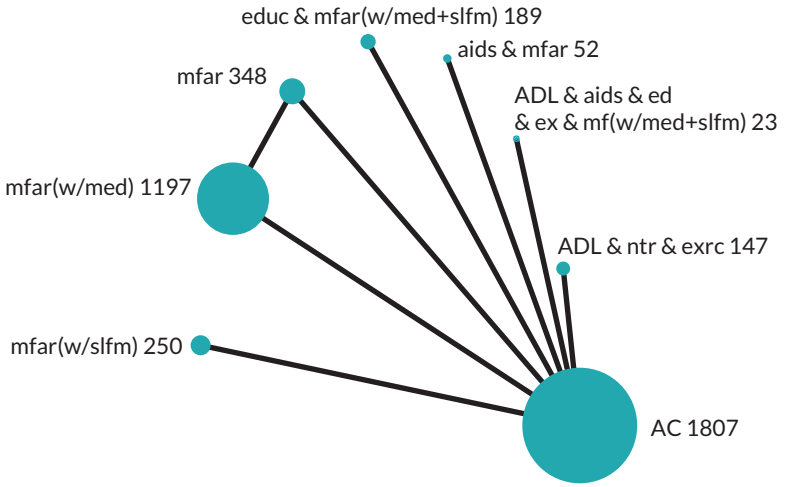
Available-care network

Short-term time frame

The available-care network for living at home in the short term included eight studies (n = 4013) with eight intervention groups (see *Table 5* for a summary of findings).[78,113,121,126,136,165,166,190] Each comparison included one study. Two study populations included all frailty categories, two were pre-frail and frail,

TABLE 5 Living at home in the short term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Living at home
Time frame Short term; range of follow-up 24 weeks to 6 months
Setting: Community
Total studies: 8
Total participants: 4013
Comparator rank: Mean 4.7, 95% CI 2 to 7



Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (952 per 1000 with ac)		Low-risk population (980 per 1000 with ac)				
	Network summary estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Multifactorial-action and review (mfar)	OR 1.34 (0.75 to 2.39) Mixed estimate	RR 1.01 (0.99 to 1.02)	964 per 1000 (937 to 979)	12 more per 1000 (15 fewer to 27 more)	985 per 1000 (974 to 992)	5 more per 1000 (6 fewer to 12 more)	⊕⊕⊖⊖Low[b]	3.1 (1 to 6)	May result in a very slight increase in chance of living at home
ADL, nutrition and exercise (ADL & ntr & exrc)	OR 1.01 (0.25 to 4.13) Mixed estimate	RR 1.00 (0.92 to 1.02)	953 per 1000 (831 to 988)	1 more per 1000 (121 fewer to 36 more)	980 per 1000 (924 to 995)	0 per 1000 (56 fewer to 15 more)	⊕⊕⊖⊖Low[b]	4.5 (1 to 8)	May result in little to no difference in chance of living at home
Multifactorial-action and review with medication-review [mfar(w/med)]	OR 0.95 (0.58 to 1.55) Mixed estimate	RR 1.00 (0.98 to 1.01)	949 per 1000 (920 to 969)	3 fewer per 1000 (32 fewer to 17 more)	979 per 1000 (966 to 987)	1 fewer per 1000 (14 fewer to 7 more)	⊕⊕⊖⊖Low[b]	5.0 (2 to 7)	May result in little to no difference in chance of living at home

TABLE 5 Living at home in the short term: comparisons with ac summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (952 per 1000 with ac)		Low-risk population (980 per 1000 with ac)				
	Network summary estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	OR 0.52 (0.13 to 2.06) Mixed estimate	RR 0.98 (0.85 to 1.01)	912 per 1000 (725 to 976)	40 fewer per 1000 (227 fewer to 24 more)	962 per 1000 (867 to 990)	18 fewer per 1000 (113 fewer to 10 more)	⊕⊕⊖⊖Low[b]	6.2 (2 to 8)	May result in a reduction in chance of living at home
Aids, multifactorial-action and review (aids & mfar)	OR 3.06 (0.31 to 30.42) Mixed estimate	RR 1.02 (0.94 to 1.03)	984 per 1000 (859 to 998)	32 more per 1000 (93 fewer to 46 more)	993 per 1000 (938 to 999)	13 more per 1000 (42 fewer to 19 more)	⊕⊖⊖⊖Very low[b,c]	2.2 (1 to 7)	The evidence is very uncertain about the effect on chance of living at home
Multifactorial-action and review with self-management strategies [mfar(w/slfm)]	OR 1.34 (0.56 to 3.25) Mixed estimate	RR 1.01 (0.98 to 1.02)	964 per 1000 (917 to 985)	12 more per 1000 (35 fewer to 33 more)	985 per 1000 (965 to 994)	5 more per 1000 (15 fewer to 14 more)	⊕⊖⊖⊖Very low[b,d]	3.4 (1 to 7)	The evidence is very uncertain about the effect on chance of living at home
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management strategies [ADL & aids & ed & ex & mf(w/med + slfm)]	OR 0.18 (0.01 to 3.69) Mixed estimate	RR 0.89 (0.24 to 1.02)	779 per 1000 (145 to 987)	173 fewer per 1000 (807 fewer to 35 more)	897 per 1000 (295 to 994)	83 fewer per 1000 (685 fewer to 14 more)	⊕⊖⊖⊖Very low[e]	7.0 (1 to 8)	The evidence is very uncertain about the effect on chance of living at home

a Calculated from OR and an assumed comparator risk of 0.972, the median ac risk among these studies.
b Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
c Very serious concerns about RoB due to significant contamination in both groups, particularly in the intervention arm where serious deviations from the intended interventions happened. Already downgraded twice for imprecision, therefore downgrade once.
d Serious concerns about RoB due to randomisation process. Downgrade once.
e Extremely serious concerns about imprecision as CI is extremely wide. Downgrade three levels.

three were frail and one was unclassifiable. We had some concerns regarding RoB in six study results, with two at high RoB (one serious concerns, one very serious concerns).

The consistency assumption was found to hold for the network according to both the global Wald test (p = 0.238) and the node-splitting method (all contrasts $p > 0.05$). As the network contained only a single study measuring each comparison, there was no potential source of heterogeneity and therefore a common-effect model was fitted.

There was low-certainty evidence that multifactorial-action and review may result in a very slight increase in the odds of living at home compared with ac in the short term (OR 1.34, 95% CI 0.75 to 2.39). There was low-certainty evidence that ADL, nutrition and exercise (OR 1.01, 95% CI 0.25 to 4.13); and multifactorial-action and review with medication-review (OR 0.95, 95% CI 0.58 to 1.55) may result in little to no difference in odds of living at home. Education, multifactorial-action and review with medication-review and self-management may result in a reduction in odds of living at home [OR 0.52 (moderate), 95% CI 0.13 to 2.06; low certainty]. Three other comparisons with ac were of very low certainty.

Medium-term time frame

The available-care network for living at home in the medium term consisted of 21 studies (n = 16,937) with 14 intervention groups (see *Table 6* for a summary of findings).[70,84,88,103,104,106–108,116,118,119,121,136,138,142,143,150,153,158,165,178] Multifactorial-action and review with medication-review versus ac included data from six studies; two comparisons had data from two studies and the remainder had one. Four study populations included all frailty categories: one was robust, one pre-frail, six pre-frail and frail and six frail. There were some concerns with RoB in 12 of the results; the other 12 were high RoB (6 serious concerns, 3 very serious concerns).

The consistency assumption was found to hold for the network according to both the global Wald test (p = 0.796) and the node-splitting method (all contrasts $p > 0.05$). Between-study variance was estimated to be non-zero, indicating some degree of heterogeneity between studies included in the network (τ = 0.0856).

There was moderate-certainty evidence that multifactorial-action and review with medication-review probably results in a slight increase in the odds of living at home compared with ac in the medium term (OR 1.22, 95% CI 0.93 to 1.59; moderate certainty). There was low-certainty evidence that multifactorial-action with medication-review [OR 2.55 (large), 95% CI 0.61 to 10.60]; cognitive training, medication-review, nutrition and exercise [OR 1.93 (large), 95% CI 0.79 to 4.77]; and ADL, nutrition and exercise [OR 1.79 (large), 95% CI 0.67 to 4.76] may result in an increase in the odds of living at home compared with ac. There was low-certainty evidence that risk-screening (OR 0.90, 95% CI 0.66 to 1.23); and education, multifactorial-action and review with medication-review (OR 0.88, 95% CI 0.60 to 1.29) may result in a very slight reduction in odds of living at home. There was low-certainty evidence that education, multifactorial-action and review with medication-review and self-management may result in a reduction in odds of living at home [OR 0.41 (very large), 95% CI 0.14 to 1.17]. Other comparisons with ac were of very low certainty.

Investigation of small-study effects

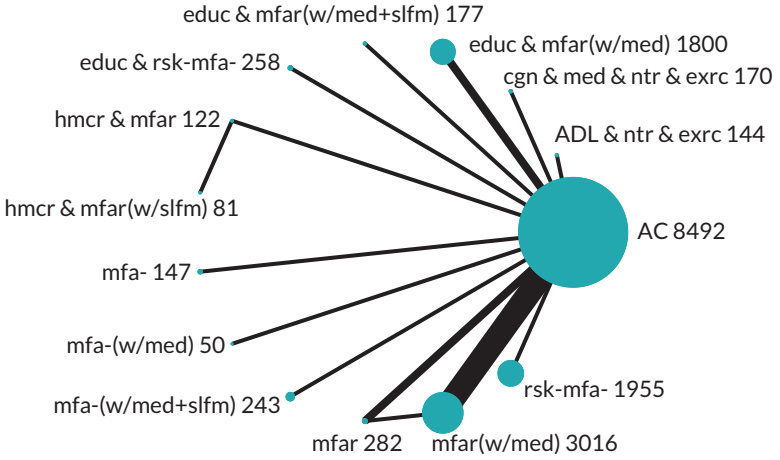
The comparison-adjusted funnel plot appeared symmetric, implying no evidence of small-study effects in the network.

Sensitivity analysis for risk of bias

After removing the 3 study results with very serious concerns about RoB, an additional study was disconnected, leaving 17 results (n = 15,457) and 11 intervention groups in the sensitivity analysis. The estimates of effect and CIs were very similar for the comparisons with ac rated as moderate or low

TABLE 6 Living at home in the medium term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Living at home
Time: Medium term; range of follow-up 12 to 18 months
Setting: Community
Total studies: 21
Total participants: 16,937
Comparator rank: Mean 9.9, 95% CI 7 to 12



	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population [833 per 1000 with ac]		Low-risk population [981 per 1000 with ac]				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Multifactorial-action and review with medication-review [mfar(w/med)]	OR 1.22 (0.93 to 1.59) Mixed estimate	RR 1.01 (1.00 to 1.02)	859 per 1000 (823 to 888)	26 more per 1000 (10 fewer to 55 more)	984 per 1000 (980 to 988)	3 more per 1000 (1 fewer to 7 more)	⊕⊕⊕⊖Moderate[b]	7.5 (5 to 11)	Probably results in a slight increase in chance of living at home
Multifactorial-action with medication-review [mfa-(w/med)]	OR 2.55 (0.61 to 10.60) Mixed estimate	RR 1.04 (0.96 to 1.06)	927 per 1000 (754 to 981)	94 more per 1000 (79 fewer to 148 more)	992 per 1000 (969 to 998)	11 more per 1000 (12 fewer to 17 more)	⊕⊕⊖⊖Low[c]	4.6 (1 to 13)	May result in an increase in chance of living at home
Cognitive training, medication-review, nutrition and exercise (cgn & med & ntr & exrc)	OR 1.93 (0.79 to 4.77) Mixed estimate	RR 1.03 (0.98 to 1.05)	906 per 1000 (797 to 960)	73 more per 1000 (36 fewer to 127 more)	990 per 1000 (976 to 996)	9 more per 1000 (5 fewer to 15 more)	⊕⊕⊖⊖Low[c]	5.3 (2 to 12)	May result in an increase in chance of living at home

continued

TABLE 6 Living at home in the medium term: comparisons with ac summary of findings table (*continued*)

	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population [833 per 1000 with ac]		Low-risk population [981 per 1000 with ac]				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
ADL, nutrition and exercise (ADL & ntr & exrc)	OR 1.79 (0.67 to 4.76) Mixed estimate	RR 1.03 (0.97 to 1.05)	899 per 1000 (771 to 960)	66 more per 1000 (62 fewer to 127 more)	989 per 1000 (972 to 996)	8 more per 1000 (9 fewer to 15 more)	⊕⊕⊖⊖Low[c]	5.9 (2 to 13)	May result in an increase in chance of living at home
Risk-screening (rsk-mfa-)	OR 0.90 (0.66 to 1.23) Mixed estimate	RR 0.99 (0.97 to 1.01)	818 per 1000 (768 to 860)	15 fewer per 1000 (65 fewer to 27 more)	979 per 1000 (972 to 984)	2 fewer per 1000 (9 fewer to 3 more)	⊕⊕⊖⊖Low[c]	11.1 (7 to 13)	May result in a very slight reduction in chance of living at home
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]	OR 0.88 (0.60 to 1.29) Mixed estimate	RR 0.99 (0.96 to 1.01)	814 per 1000 (749 to 865)	19 fewer per 1000 (84 fewer to 32 more)	978 per 1000 (969 to 985)	3 fewer per 1000 (12 fewer to 4 more)	⊕⊕⊖⊖Low[c]	11.2 (6 to 14)	May result in a very slight reduction in chance of living at home
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	OR 0.41 (0.14 to 1.17) Mixed estimate	RR 0.91 (0.72 to 1.01)	670 per 1000 (413 to 854)	163 fewer per 1000 (420 fewer to 21 more)	955 per 1000 (879 to 984)	26 fewer per 1000 (102 fewer to 3 more)	⊕⊕⊖⊖Low[c]	13.5 (8 to 14)	May result in a reduction in chance of living at home
Homecare, multifactorial-action and review with self-management strategies [hmcr & mfar(w/slfm)]	OR 8.89 (1.90 to 41.62) Indirect estimate	RR 1.06 (1.03 to 1.07)	978 per 1000 (904 to 995)	145 more per 1000 (71 more to 162 more)	998 per 1000 (990 to 1000)	17 more per 1000 (9 more to 19 more)	⊕⊖⊖⊖Very low[d,e]	1.5 (1 to 4)	The evidence is very uncertain about the effect on chance of living at home
Homecare, multifactorial-action and review (hmcr & mfar)	OR 5.71 (1.65 to 19.83) Mixed estimate	RR 1.06 (1.03 to 1.07)	966 per 1000 (891 to 990)	133 more per 1000 (58 more to 157 more)	997 per 1000 (988 to 999)	16 more per 1000 (7 more to 18 more)	⊕⊖⊖⊖Very low[f,g]	2.4 (1 to 5)	The evidence is very uncertain about the effect on chance of living at home

TABLE 6 Living at home in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population [833 per 1000 with ac]		Low-risk population [981 per 1000 with ac]				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Multifactorial-action (mfa-)	OR 2.23 (0.63 to 7.91) Mixed estimate	RR 1.04 (0.96 to 1.06)	917 per 1000 (758 to 975)	84 more per 1000 (75 fewer to 142 more)	991 per 1000 (970 to 998)	10 more per 1000 (11 fewer to 17 more)	⊕⊖⊖⊖Very low[c,h]	4.9 (1 to 13)	The evidence is very uncertain about the effect on chance of living at home
Multifactorial-action and review (mfar)	OR 1.15 (0.60 to 2.18) Mixed estimate	RR 1.01 (0.96 to 1.04)	851 per 1000 (751 to 916)	18 more per 1000 (82 fewer to 83 more)	983 per 1000 (969 to 991)	2 more per 1000 (12 fewer to 10 more)	⊕⊖⊖⊖Very low[c,i]	8.4 (4 to 13)	The evidence is very uncertain about the effect on chance of living at home
Education and risk-screening (educ & rsk-mfa-)	OR 1.09 (0.60 to 2.01) Mixed estimate	RR 1.01 (0.96 to 1.03)	845 per 1000 (748 to 909)	12 more per 1000 (85 fewer to 76 more)	983 per 1000 (968 to 990)	2 more per 1000 (13 fewer to 9 more)	⊕⊖⊖⊖Very low[c,h]	8.9 (4 to 13)	The evidence is very uncertain about the effect on chance of living at home
Multifactorial-action with medication-review and self-management strategies [mfa-(w/med + slfm)]	OR 1.00 (0.63 to 1.58) Mixed estimate	RR 1.00 (0.96 to 1.02)	833 per 1000 (759 to 888)	0 per 1000 (74 fewer to 55 more)	981 per 1000 (970 to 988)	0 per 1000 (11 fewer to 7 more)	⊕⊖⊖⊖Very low[c,j]	9.8 (5 to 13)	The evidence is very uncertain about the effect on chance of living at home

a Calculated from OR and an assumed comparator risk of 0.935, the median ac risk among these studies.
b Serious concerns about imprecision as CI crosses the no effect line and includes substantial benefit. The CI for the absolute effect with a high-risk population also includes our pre-specified definition of very small harm but given this was marginal and in light of the small lower CI for the RR (0.9955), we did not judge this as very serious. Downgrade once.
c Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
d Very serious concerns about RoB due to excluding participants in per-protocol analysis and missing outcome data in the indirect evidence via the homecare, multifactorial-action and review vs. ac comparison. Downgrade twice.
e Very serious concerns about imprecision as CI is very wide, there is no closed loop and the direct comparison is based on indirect evidence from 122 persons in homecare, multifactorial-action and review and 81 persons in homecare, multifactorial-action and review with self-management, which does not meet the optimal information size. Downgrade twice.
f Very serious concerns about RoB due to excluding participants in per-protocol analysis and missing outcome data. Downgrade twice.
g Very serious concerns about imprecision as CI is very wide, and there is no closed loop and the direct comparison is based on indirect evidence from 122 persons in homecare, multifactorial-action and review, which does not meet the optimal information size. Already downgraded twice, downgrade once.
h Serious concerns about RoB due to missing outcome data. Downgrade once.
i Serious concerns about Rob due to the recruitment process of participants and missing outcome data in one study. Downgrade once.
j Very serious concerns about RoB due to randomisation process and missing outcome data. Already downgraded twice, downgrade once.

certainty in the main analysis. Only the comparison of multifactorial-action and review with ac changed notably, with a greater point estimate and even wider CIs.

Investigation of frailty

All frailty categories were represented in the network and a network meta regression model was fitted including the frailty variable with 'all (robust, pre-frail and frail)' set as the reference category. The consistency assumption remained valid (global Wald test $p = 0.701$, node-splitting method showed all contrasts $p > 0.05$). Between-study variance remained very small, but non-zero ($\tau = 3.86 \times 10^{-7}$). Frailty effects could not be estimated for most contrasts due to collinearity. Where frailty effects could be estimated, the effect was estimated with very large uncertainty as reflected in wide 95% CIs covering a broad range of both beneficial and harmful effects, making interpretation of these results meaningless in practice.

Long-term time frame

The available-care network for living at home in the long term included 13 studies ($n = 14,843$) with 10 intervention groups (see *Table 7* for a summary of findings).[76,92,93,106,116,118,121,136,162,164,165,172,173] Multifactorial-action and review with medication-review versus ac included data from three studies; two comparisons had data from two studies and the remainder had one. Four study populations included all frailty categories, one included the robust and pre-frail categories, three the pre-frail and frail categories, one was pre-frail, three frail and one was unclassifiable. There were some concerns regarding RoB in nine study results and four were high RoB (three with serious concerns, one with very serious concerns).

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted, setting the inconsistency parameter in the model to zero for all comparisons. Between-study variance was estimated to be very small but non-zero, indicating some degree of heterogeneity between studies included in the network ($\tau = 9.92 \times 10^{-7}$).

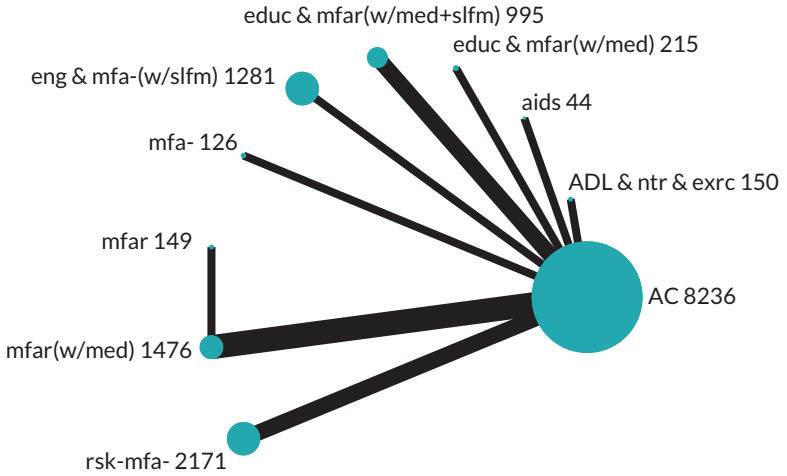
There was low-certainty evidence that multifactorial-action and review [OR 1.29 (moderate), 95% CI 0.63 to 2.63]; and education, multifactorial-action and review with medication-review [OR 1.23 (moderate), 95% CI 0.72 to 2.10] may both result in an increase in the odds of living at home compared with ac in the long term. Multifactorial-action and review with medication-review (OR 1.17, 95% CI 0.94 to 1.47); and ADL, nutrition and exercise (OR 1.15, 95% CI 0.64 to 2.05) may both result in a slight increase in the odds of living at home. Meaningful-activities and multifactorial-action with self-management may result in a very slight increase in the odds of living at home (OR 1.03, 95% CI 0.85 to 1.25). Risk-screening may result in a slight reduction in odds of living at home (OR 0.91, 95% CI 0.77 to 1.07). Three other comparisons with ac were of very low certainty.

Across time frames

Multifactorial-action and review with medication-review [mfar(w/med)] was estimated to make little to no difference in the short term (low certainty) but result in small (moderate or low certainty) increases in living at home in the medium- and long-term time frames, respectively. Similarly, ADL, nutrition and exercise (ADL & ntr & exrc) may make little to no difference in the short term but result in large or small increases in living at home in the medium- and long-term time frames, respectively (low certainty). Conversely, there was low-certainty evidence that education, multifactorial-action and review with medication-review and self-management [educ & mfar(w/med + slfm)] may result in moderate or very large reductions in living at home in the short- and medium-term time frames, respectively. Risk-screening (rsk-mfa-) may result in a very slight or slight reduction in odds of living at home in the medium and long term, respectively (low certainty). There was contrasting evidence of low certainty that education, multifactorial-action and review with medication-review [educ & mfar(w/med)] may result in a slight reduction or moderate increase in living at home in the medium- and long-term time frames, respectively.

TABLE 7 Living at home in the long term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Living at home
Time frame: Long term; range of follow-up 24–43 months
Setting: Community
Total studies: 13
Total participants: 14,843
Comparator rank: Mean 7.5, 95% CI 5 to 9



Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population [607 per 1000 with ac]		Low-risk population [932 per 1000 with ac]				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Multifactorial-action and review (mfar)	OR 1.29 (0.63 to 2.63) Indirect estimate	RR 1.04 (0.90 to 1.13)	665 per 1000 (492 to 803)	58 more per 1000 (115 fewer to 196 more)	946 per 1000 (896 to 973)	14 more per 1000 (36 fewer to 41 more)	⊕⊕⊖⊖Low[b]	5.0 (1 to 10)	May result in an increase in chance of living at home
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]	OR 1.23 (0.72 to 2.10) Mixed estimate	RR 1.04 (0.93 to 1.11)	654 per 1000 (525 to 764)	47 more per 1000 (82 fewer to 157 more)	944 per 1000 (908 to 966)	12 more per 1000 (24 fewer to 34 more)	⊕⊕⊖⊖Low[b]	5.2 (2 to 10)	May result in an increase in chance of living at home
Multifactorial-action and review with medication-review [mfar(w/med)]	OR 1.17 (0.94 to 1.47) Mixed estimate	RR 1.03 (0.99 to 1.06)	645 per 1000 (592 to 694)	38 more per 1000 (15 fewer to 87 more)	942 per 1000 (928 to 953)	10 more per 1000 (4 fewer to 21 more)	⊕⊕⊖⊖Low[b]	5.2 (3 to 9)	May result in a slight increase in chance of living at home

continued

TABLE 7 Living at home in the long term: comparisons with ac summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population [607 per 1000 with ac]		Low-risk population [932 per 1000 with ac]				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
ADL, nutrition and exercise (ADL & ntr & exrc)	OR 1.15 (0.64 to 2.05) Mixed estimate	RR 1.02 (0.91 to 1.10)	639 per 1000 (499 to 760)	32 more per 1000 (108 fewer to 153 more)	940 per 1000 (898 to 966)	8 more per 1000 (34 fewer to 34 more)	⊕⊕⊖⊖Low[b]	5.8 (2 to 10)	May result in a slight increase in chance of living at home
Engagement in meaningful-activities and multifactorial-action with self-management strategies [eng & mfa-(w/slfm)]	OR 1.03 (0.85 to 1.25) Mixed estimate	RR 1.01 (0.97 to 1.04)	614 per 1000 (567 to 658)	7 more per 1000 (40 fewer to 51 more)	934 per 1000 (921 to 945)	2 more per 1000 (11 fewer to 13 more)	⊕⊕⊖⊖Low[b]	6.9 (3 to 10)	May result in a very slight increase in chance of living at home
Risk-screening (rsk-mfa-)	OR 0.91 (0.77 to 1.07) Mixed estimate	RR 0.98 (0.95 to 1.01)	584 per 1000 (543 to 624)	23 fewer per 1000 (64 fewer to 17 more)	926 per 1000 (913 to 936)	6 fewer per 1000 (19 fewer to 4 more)	⊕⊕⊖⊖Low[b]	8.8 (6 to 10)	May result in a slight reduction in chance of living at home
Aids (aids)	OR 2.64 (1.02 to 6.88) Mixed estimate	RR 1.13 (1.00 to 1.19)	803 per 1000 (611 to 914)	196 more per 1000 (4 more to 307 more)	973 per 1000 (933 to 990)	41 more per 1000 (1 more to 58 more)	⊕⊖⊖⊖Very low[c,d]	1.8 (1 to 7)	The evidence is very uncertain about the effect on chance of living at home
Multifactorial-action (mfa-)	OR 2.13 (0.85 to 5.33) Mixed estimate	RR 1.11 (0.97 to 1.18)	767 per 1000 (568 to 892)	160 more per 1000 (39 fewer to 285 more)	967 per 1000 (921 to 986)	35 more per 1000 (11 fewer to 54 more)	⊕⊖⊖⊖Very low[b,e]	2.5 (1 to 9)	The evidence is very uncertain about the effect on chance of living at home
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	OR 1.08 (0.78 to 1.49) Mixed estimate	RR 1.01 (0.95 to 1.06)	625 per 1000 (547 to 697)	18 more per 1000 (60 fewer to 90 more)	937 per 1000 (915 to 953)	5 more per 1000 (17 fewer to 21 more)	⊕⊖⊖⊖Very low[b,e]	6.3 (3 to 10)	The evidence is very uncertain about the effect on chance of living at home

a Calculated from OR and an assumed comparator risk of 0.816, the median ac risk among these studies.
b Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
c Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.
d Serious concerns about imprecision as no closed loop and direct comparison is based on 110 persons which does not meet optimal information size. Downgrade once (already downgraded twice for RoB).
e Serious concerns about RoB due to missing outcome data. Downgrade once.

Homecare network

Short-term time frame

The homecare network for living at home in the short term included four studies (n = 704) and four intervention groups (see *Table 8* for a summary of findings).[91,117,146,154] The comparison of homecare, ADL, multifactorial-action and review with self-management strategies versus homecare included the data of two studies, with the other two comparisons comprised of one study each. One study population was classified as pre-frail and frail, and three were frail. We had some concerns with RoB in three study results and one was at high RoB (serious concerns).

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. Between-study variance was estimated to be very small but non-zero, indicating some degree of heterogeneity between studies included in the network ($\tau = 2.85 \times 10^{-7}$).

There was low-certainty evidence that homecare, ADL, multifactorial-action and review with self-management [OR 0.63 (moderate), 95% CI 0.31 to 1.26]; and homecare and nutrition [OR 0.34 (very large), 95% CI 0.12 to 0.95] may result in reductions in the odds of living at home compared with homecare in the short term. There was very low-certainty evidence regarding homecare and multifactorial-action versus homecare.

Medium-term time frame

Overall characteristics

The homecare network for living at home in the medium term included five studies (n = 1978) and six intervention groups (see *Table 9* for a summary of findings).[91,125,146,154,189] Each comparison consisted of one study. All study populations were frail. There were some concerns about RoB in one study and four were at high RoB (three with serious concerns, one with very serious concerns).

Main analysis

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. As the network contained only a single study for each comparison, there was no potential source of heterogeneity and therefore a common-effect model was fitted.

There was low-certainty evidence that homecare, ADL, multifactorial-action and review with self-management may result in a reduction in the odds of living at home compared with homecare in the medium term [OR 0.76 (large), 95% CI 0.40 to 1.45]. The evidence was very uncertain for four other comparisons with homecare.

Investigation of small-study effects

There were fewer than 10 studies in the network so small-study effects were not investigated.

Sensitivity analysis for risk of bias

After removing the one study for which we had very serious concerns about RoB there remained four studies (n = 1234) and five intervention groups in the sensitivity analysis. The point estimates and CIs were the same in comparisons with ac for the intervention groups that remained in the analysis.

Investigation of frailty

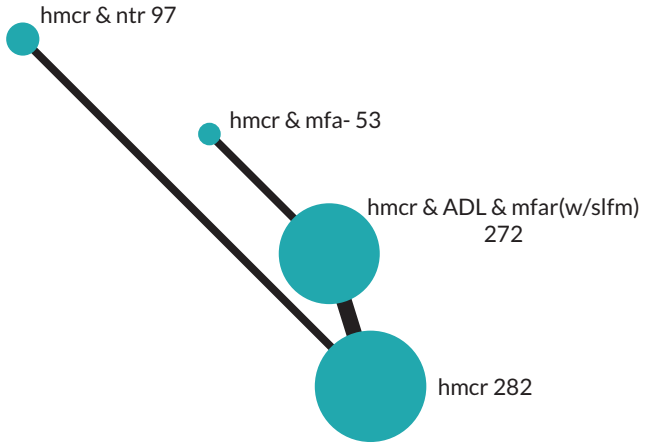
Because all study populations were categorised as frail it was not possible to investigate the effects of frailty for this analysis.

Long-term time frame

There were only two homecare comparisons in the long term (homecare and multifactorial-action vs. homecare, multifactorial-action and review; and homecare, multifactorial-action and review vs.

TABLE 8 Living at home in the short term: comparisons with homecare summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Homecare (hmcr)
Outcome: Living at home
Time frame: Short term; range of follow-up 6–7 months
Setting: Community
Total studies: 4
Total participants: 704
Comparator rank: Mean 1.1, 95% CI

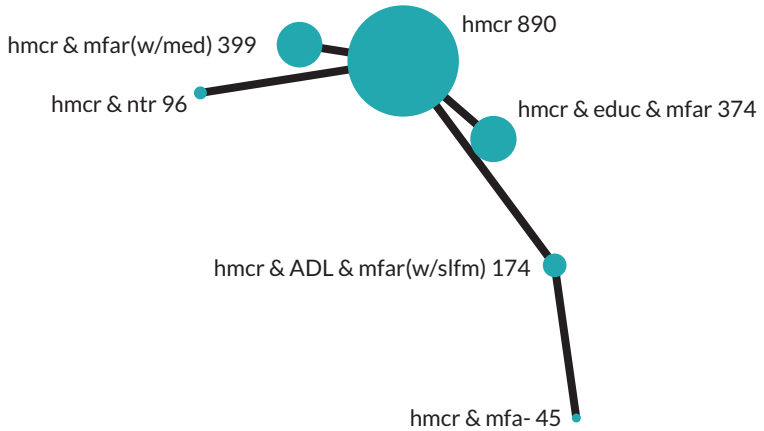


	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (923 per 1000 with hmcr)		Low-risk population (953 per 1000 with hmcr)				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)]	OR 0.63 (0.31 to 1.26) Mixed estimate	RR 0.96 (0.86 to 1.02)	882 per 1000 (789 to 938)	41 fewer per 1000 (134 fewer to 15 more)	927 per 1000 (863 to 962)	26 fewer per 1000 (90 fewer to 9 more)	⊕⊕⊖⊖Low[b]	2.1 (1 to 3)	May result in a reduction in chance of living at home
Homecare and nutrition (hmcr & ntr)	OR 0.34 (0.12 to 0.95) Mixed estimate	RR 0.87 (0.64 to 1.00)	801 per 1000 (588 to 919)	122 fewer per 1000 (335 fewer to 4 fewer)	872 per 1000 (707 to 951)	81 fewer per 1000 (246 fewer to 2 fewer)	⊕⊕⊖⊖Low[c]	3.2 (2 to 4)	May result in a reduction in chance of living at home
Homecare and multifactorial-action (hmcr & mfa-)	OR 0.26 (0.09 to 0.77) Indirect estimate	RR 0.82 (0.56 to 0.98)	756 per 1000 (512 to 902)	167 fewer per 1000 (411 fewer to 21 fewer)	840 per 1000 (639 to 940)	113 fewer per 1000 (314 fewer to 13 fewer)	⊕⊖⊖⊖Very low[d,e]	3.6 (3 to 4)	The evidence is very uncertain about the effect on chance of living at home

a Calculated from OR and an assumed comparator risk of 0.924, the median ac risk among these studies.
b Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
c Very serious concerns about imprecision as the optimal information size is not met. The CI is very wide: OR CI ratio 8.0; 588 to 919 per 1000 in the high-risk population. There is no closed loop and the direct comparison is based on evidence from 163 persons. Downgrade twice.
d Serious concerns about RoB due to missing outcome data. Downgrade once.
e Very serious concerns about imprecision as the optimal information size is not met. The CI is very wide: OR CI ratio 8.8; 512 to 902 per 1000 in the high-risk population. There is no direct evidence, the indirect evidence coming from the comparison of hmcr & mfa - vs. hmcr & ADL & mfar(w/slfm) with 104 participants. Downgrade twice.

TABLE 9 Living at home in the medium term: comparisons with homecare summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Homecare (hmcr)
Outcome: Living at home
Time frame: Medium term; range of follow-up 12–13 months
Setting: Community
Total studies: 5
Total participants: 1978
Comparator rank: Mean 3.0, 95% CI 1 to 5



	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (649 per 1000 with hmcr)		Low-risk population (843 per 1000 with hmcr)				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)]	OR 0.76 (0.40 to 1.45) Mixed estimate	RR 0.92 (0.72 to 1.09)	585 per 1000 (426 to 728)	64 fewer per 1000 (223 fewer to 79 more)	804 per 1000 (683 to 886)	39 fewer per 1000 (160 fewer to 43 more)	⊕⊕⊖⊖Low[b]	3.8 (1 to 6)	May result in a reduction in chance of living at home
Homecare, education, multifactorial-action and review (hmcr & educ & mfar)	OR 1.17 (0.85 to 1.59) Mixed estimate	RR 1.04 (0.96 to 1.11)	683 per 1000 (612 to 747)	34 more per 1000 (37 fewer to 98 more)	862 per 1000 (821 to 895)	19 more per 1000 (22 fewer to 52 more)	⊕⊖⊖⊖Very low[b,c]	1.8 (1 to 4)	The evidence is very uncertain about the effect on chance of living at home
Homecare, multifactorial-action and review with medication-review [hmcr & mfar(w/med)]	OR 1.11 (0.82 to 1.51) Mixed estimate	RR 1.03 (0.94 to 1.10)	672 per 1000 (601 to 736)	23 more per 1000 (48 fewer to 87 more)	856 per 1000 (814 to 890)	13 more per 1000 (29 fewer to 47 more)	⊕⊖⊖⊖Very low[b,d]	2.1 (1 to 4)	The evidence is very uncertain about the effect on chance of living at home

continued

TABLE 9 Living at home in the medium term: comparisons with homecare summary of findings table (*continued*)

	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (649 per 1000 with hmcr)		Low-risk population (843 per 1000 with hmcr)				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Homecare and multifactorial-action (hmcr & mfa-)	OR 0.51 (0.17 to 1.49) Indirect estimate	RR 0.80 (0.45 to 1.09)	485 per 1000 (243 to 734)	164 fewer per 1000 (406 fewer to 85 more)	732 per 1000 (483 to 889)	111 fewer per 1000 (360 fewer to 46 more)	⊕⊖⊖⊖Very low[b,d]	5.1 (1 to 6)	The evidence is very uncertain about the effect on chance of living at home
Homecare and nutrition (hmcr & ntr)	OR 0.50 (0.23 to 1.07) Mixed estimate	RR 0.79 (0.54 to 1.02)	480 per 1000 (301 to 664)	169 fewer per 1000 (348 fewer to 15 more)	729 per 1000 (556 to 852)	114 fewer per 1000 (287 fewer to 9 more)	⊕⊖⊖⊖Very low[b,d]	5.2 (2 to 6)	The evidence is very uncertain about the effect on chance of living at home

a Calculated from OR and an assumed comparator risk of 0.738, the median ac risk among these studies.
b Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
c Very serious concerns about RoB due to randomisation process and missing outcome data. Already downgraded twice for imprecision, downgrade once.
d Serious concerns about RoB due to missing outcome data. Downgrade once.

homecare, multifactorial-action and review with self-management), so there was insufficient evidence to conduct an NMA.[103,147]

Across time frames

In the short- and medium-term time frames, there was low-certainty evidence that homecare, ADL, multifactorial-action and review with self-management may result in a moderate or large reduction in the odds of living at home compared with homecare alone.

Independence in instrumental activities of daily living

Continuous IADL outcomes were analysed using the SMD. Where necessary, scales were transformed so that greater scores equated to greater independence in IADL. For each time frame there were two separate networks, one with ac reference comparator and one with a homecare comparator, which we describe in turn.

Available-care network

Short-term time frame

A total of six studies and seven intervention groups were analysed for the short-term IADL available-care network (see *Table 10* for a summary of findings).[79,99,136,141,152,166] Intervention groups ranged from 595 participants (ac) to 24 (ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management). The populations were pre-frail, frail or both in all but one study.[79] All results were at high RoB (five: serious concerns, one: very serious concerns).

The network contained no loops and, therefore, the consistency assumption could not be tested, and a 'consistency' model was fitted. As the network contained only a single study for each comparison, there was no potential source of heterogeneity and therefore a common-effect model was fitted for the short-term IADL available-care network. There was low-certainty evidence that education, multifactorial-action and review with medication-review and self-management may result in a slight reduction in IADL independence (SMD −0.22, 95% CI −0.45 to 0.00). All other short-term estimates were of very low certainty due to imprecision and RoB.

The 95% CI for the true rank was typically wide, encompassing six of the seven ranks for all intervention groups except education, multifactorial-action and review with medication-review and self-management (95% CI 5 to 7).

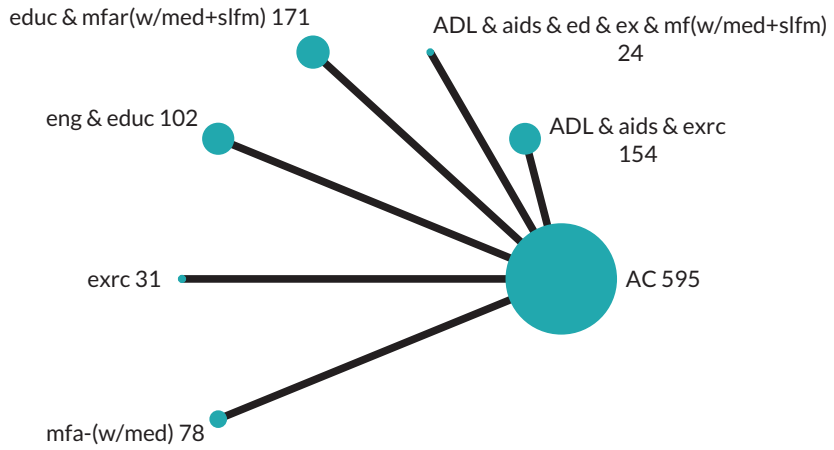
Medium-term time frame

Overall characteristics

For the medium-term IADL available-care network there was a total of 16 studies (n = 5309) with 14 intervention groups in the network, including the largest node ac (n = 3136; see *Table 11* for a summary of findings).[70,73,74,79,86,88,96,99,108,136,138,152,155,167,172,177] Within the network a single study provided a direct comparison for each experimental intervention group, except multifactorial-action and review with medication-review which has four studies. In the network, the number of participants ranged from 34 (aids) to 702 (multifactorial-action and review with medication-review) excluding the comparator ac. The populations of three studies spanned all frailty categories, one study was of a robust population, five a frail population, six studies covered the other categories and one was unclassifiable. There were some concerns regarding RoB in 1 study result, with the other 15 results being at high RoB (10 serious concerns, 5 very serious concerns).

TABLE 10 Instrumental activities of daily living in the short term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Independence in IADL
Time frame: Short term; range of follow-up 24 weeks to 9 months
Setting: Community
Total studies: 6
Total participants: 1155
Comparator rank: Mean 4.4, 95% CI 2 to 6



Intervention group	Anticipated absolute effect (95% CI) SMD	MD (Lawton IADL 0–8)[a]	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Education, multifactorial-action and review with medication-review and self-management [educ & mfar(w/med + slfm)]	SMD 0.22 lower (0.45 lower to 0.00) Mixed estimate	MD 0.59 lower (1.17 lower to 0.01 lower)	⊕⊕⊖⊖Low[b,c]	6.5 (5 to 7)	May result in a slight reduction in IADL independence
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management [ADL&aids&ed&ex&mf(w/med + slfm)]	SMD 0.38 higher (0.26 lower to 1.01 higher) Mixed estimate	MD 0.98 higher (0.69 lower to 2.66 higher)	⊕⊖⊖⊖Very low[b,d]	1.9 (1 to 7)	The evidence is very uncertain about the effect on IADL independence
ADL training, aids-adaptations and physical exercise (ADL & aids & exrc)	SMD 0.14 higher (0.09 lower to 0.36 higher) Mixed estimate	MD 0.36 higher (0.24 lower to 0.95 higher)	⊕⊖⊖⊖Very low[b,d]	2.8 (1 to 6)	The evidence is very uncertain about the effect on IADL independence
Engagement in meaningful-activities and education (eng & educ)	SMD 0.06 higher (0.18 lower to 0.30 higher) Mixed estimate	MD 0.16 higher (0.46 lower to 0.79 higher)	⊕⊖⊖⊖Very low[e,f]	3.5 (1 to 6)	The evidence is very uncertain about the effect on IADL independence

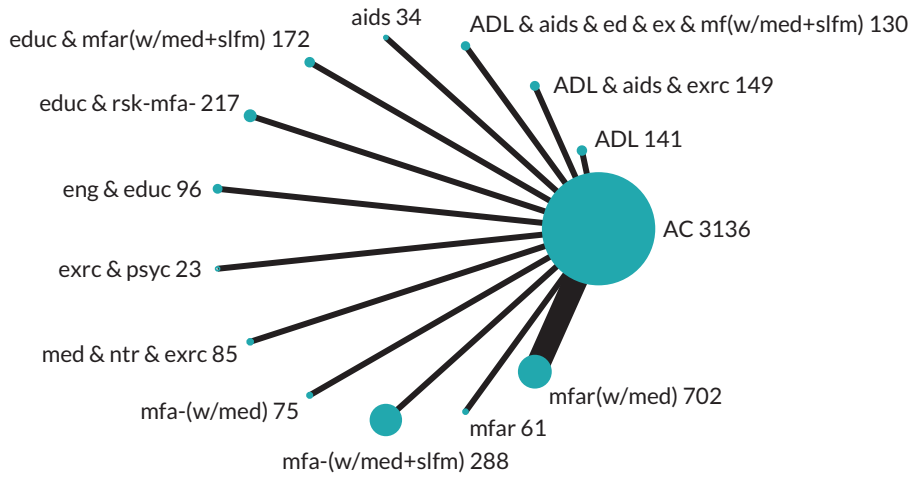
TABLE 10 Instrumental activities of daily living in the short term: comparisons with ac summary of findings table (*continued*)

Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Lawton IADL 0–8)[a]			
Exercise (exrc)	SMD 0.00 (0.60 lower to 0.60 higher) Mixed estimate	MD 0.00 (1.58 lower to 1.58 higher)	⊕⊖⊖⊖Very low[d,g]	4.2 (1 to 7)	The evidence is very uncertain about the effect on IADL independence
Multifactorial-action with medication-review [mfa-(w/med)]	SMD 0.05 lower (0.37 lower to 0.27 higher) Mixed estimate	MD 0.13 lower (0.98 lower to 0.71 higher)	⊕⊖⊖⊖Very low[b,d]	4.8 (2 to 7)	The evidence is very uncertain about the effect on IADL independence

a Calculated from the estimated SMD using a SD of 2.62, the pooled SD across intervention groups reporting the Lawton IADL.
b Serious concerns about RoB due to missing outcome data. Downgrade once.
c Serious concerns about imprecision as no closed loop and direct comparison is based on 316 persons which does not meet optimal information size. Downgrade once.
d Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
e Very serious concerns about RoB due to randomisation process, missing outcome data and reported results were not analysed according to allocation. Downgrade twice.
f Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.
g Serious concerns about RoB due to ceiling effect in the outcome measurement for a substantial proportion of participants. Downgrade once.

TABLE 11 Instrumental activities of daily living in the medium term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Independence in IADL
Time frame: Medium term; range of follow-up 10–18 months
Setting: Community
Total studies: 16
Total participants: 5309
Comparator rank: Mean 7.2, 95% CI 5 to 9



Intervention group	Anticipated absolute effect (95% CI) SMD	MD (Lawton IADL 0–8)[a]	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Multifactorial-action and review with medication-review [mfar(w/med)]	SMD 0.11 higher (0.00 to 0.21 higher) Mixed estimate	MD 0.28 higher (0.01 higher to 0.55 higher)	⊕⊕⊕⊖Moderate[b]	4.4 (2 to 7)	Probably results in a very slight increase in IADL independence
ADL, aids and exercise (ADL & aids & exrc)	SMD 0.19 lower (0.42 lower to 0.04 higher) Mixed estimate	MD 0.50 lower (1.11 lower to 0.11 higher)	⊕⊕⊖⊖Low[b,c]	11.2 (5 to 13)	May result in a slight reduction in IADL independence
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management [ADL&aids&ed&ex&mf(w/med + slfm)]	SMD 0.56 lower (0.81 lower to 0.31 lower) Mixed estimate	MD 1.47 lower (2.12 lower to 0.82 lower)	⊕⊕⊖⊖Low[b,d]	13.9 (13 to 14)	May result in a reduction in IADL independence
Multifactorial-action and review (mfar)	SMD 0.50 higher (0.15 higher to 0.86 higher) Mixed estimate	MD 1.32 higher (0.38 higher to 2.26 higher)	⊕⊖⊖⊖Very low[e,f]	1.2 (1 to 4)	The evidence is very uncertain about the effect on IADL independence
Medication-review, nutrition and exercise (med & ntr & exrc)	SMD 0.21 higher (0.08 lower to 0.51 higher) Mixed estimate	MD 0.56 higher (0.22 lower to 1.34 higher)	⊕⊖⊖⊖Very low[b,g]	3.2 (1 to 10)	The evidence is very uncertain about the effect on IADL independence

TABLE 11 Instrumental activities of daily living in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Lawton IADL 0–8)[a]			
ADL (ADL)	SMD 0.10 higher (0.12 lower to 0.33 higher) Mixed estimate	MD 0.27 higher (0.31 lower to 0.86 higher)	⊕⊖⊖⊖Very low[b,g]	4.9 (2 to 10)	The evidence is very uncertain about the effect on IADL independence
Multifactorial-action with medication-review [mfa-(w/med)]	SMD 0.02 higher (0.30 lower to 0.35 higher) Mixed estimate	MD 0.06 higher (0.79 lower to 0.92 higher)	⊕⊖⊖⊖Very low[b,g]	6.7 (2 to 13)	The evidence is very uncertain about the effect on IADL independence
Education and risk-screening (educ & rsk-mfa-)	SMD 0.00 (0.19 lower to 0.19 higher) Mixed estimate	MD 0.00 (0.50 lower to 0.50 higher)	⊕⊖⊖⊖Very low[b,g]	7.1 (3 to 12)	The evidence is very uncertain about the effect on IADL independence
Engagement in meaningful-activities and education (eng & educ)	SMD 0.01 lower (0.26 lower to 0.23 higher) Mixed estimate	MD 0.03 lower (0.68 lower to 0.61 higher)	⊕⊖⊖⊖Very low[h,i]	7.5 (2 to 13)	The evidence is very uncertain about the effect on IADL independence
Exercise and psychology (exrc & psyc)	SMD 0.12 lower (0.60 lower to 0.37 higher) Mixed estimate	MD 0.30 lower (1.58 lower to 0.98 higher)	⊕⊖⊖⊖Very low[i,j]	8.9 (2 to 14)	The evidence is very uncertain about the effect on IADL independence
Multifactorial-action with medication-review and self-management [mfa-(w/med + slfm)]	SMD 0.07 lower (0.20 lower to 0.06 higher) Mixed estimate	MD 0.19 lower (0.53 lower to 0.15 higher)	⊕⊖⊖⊖Very low[i,k]	9.2 (5 to 12)	The evidence is very uncertain about the effect on IADL independence
Aids (aids)	SMD 0.15 lower (0.60 lower to 0.30 higher) Mixed estimate	MD 0.39 lower (1.56 lower to 0.78 higher)	⊕⊖⊖⊖Very low[i,k]	9.6 (2 to 14)	The evidence is very uncertain about the effect on IADL independence
Education, multifactorial-action and review with medication-review and self-management [educ & mfar(w/med + slfm)]	SMD 0.13 lower (0.35 lower to 0.09 higher) Mixed estimate	MD 0.34 lower (0.92 lower to 0.24 higher)	⊕⊖⊖⊖Very low[b,g]	10.1 (5 to 13)	The evidence is very uncertain about the effect on IADL independence

a Calculated from the estimated SMD using a SD of 2.62, the pooled SD across intervention groups reporting the Lawton IADL.
b Serious concerns about RoB due to missing outcome data. Downgrade once.
c Serious concerns about imprecision as CI crosses the no effect line and includes substantial harm. Downgrade once.
d Serious concerns about imprecision as no closed loop and direct comparison is based on evidence from 260 persons which does not meet optimal information size. Downgrade once.
e Serious concerns about imprecision as no closed loop and direct comparison is based on evidence from 124 persons which does not meet optimal information size. Downgrade once.
f Very serious concerns about RoB due to recruitment of participants and missing outcome data. Downgrade twice.
g Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
h Very serious concerns about RoB due to the randomisation process, missing outcome data and selection of the reported result. Downgrade twice.
i Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.
j Very serious concerns about RoB due to excluding participants in per-protocol analysis and missing outcome data. Downgrade twice.
k Very serious concerns about RoB due to the randomisation process and missing outcome data. Downgrade twice.

Main analysis

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. Between-study variance was estimated to be very small but non-zero, indicating some degree of heterogeneity between studies included in the network ($\tau = 6.91 \times 10^{-8}$). On average, multifactorial-action and review with medication-review was associated with very slightly increased independence in IADL versus ac (SMD 0.11, 95% CI 0.00 to 0.21; moderate-certainty evidence). ADL, aids and exercise may result in a slight reduction in independence in IADL versus ac (SMD −0.19, 95% CI −0.42 to 0.04; low-certainty evidence). ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management may result in a reduction in independence in IADL versus ac [SMD −0.56 (moderate), 95% CI −0.81 to −0.31; low-certainty evidence]. Other comparisons with ac were of very low certainty due to imprecision and RoB.

The 95% CI for the true ranking for multifactorial-action and review with medication-review placed it in the top half of the interventions (2–7) and ac was ranked 5th–9th. Multifactorial-action and review was ranked in the top four but note that its comparison with ac was very low certainty.

Investigation of small-study effects

The comparison-adjusted funnel plot appeared symmetric, implying no evidence of small-study effects in the network.

Sensitivity analysis for risk of bias

After removing the 3 study results with very serious concerns about RoB for the medium-term IADL available-care network, 5 studies[70,79,108,172,177] were dropped from the network due to very serious concerns of bias leaving 11 studies and 9 nodes. The inconsistency model could not run because there was no source of inconsistency.

The point estimates and CIs for the three comparisons with ac that were not very low certainty in the main analyses remained the same in sensitivity analyses. This was also the case for all other intervention groups that remained in the analysis.

Investigation of frailty

All frailty categories were represented in the network and a network meta regression model was fitted including the frailty variable with 'all (robust, pre-frail and frail)' set as the reference category. The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. Between-study variance remained very small, but non-zero ($\tau = 1.215 \times 10^{-7}$). Frailty effects could not be estimated for most contrasts due to collinearity. Where frailty effects could be estimated (only multifactorial-action and review with medication-review vs. ac), the effect was estimated with uncertainty, with a 95% CI covering both beneficial and harmful effects (SMD 0.04, 95% CI −0.02 to 0.11).

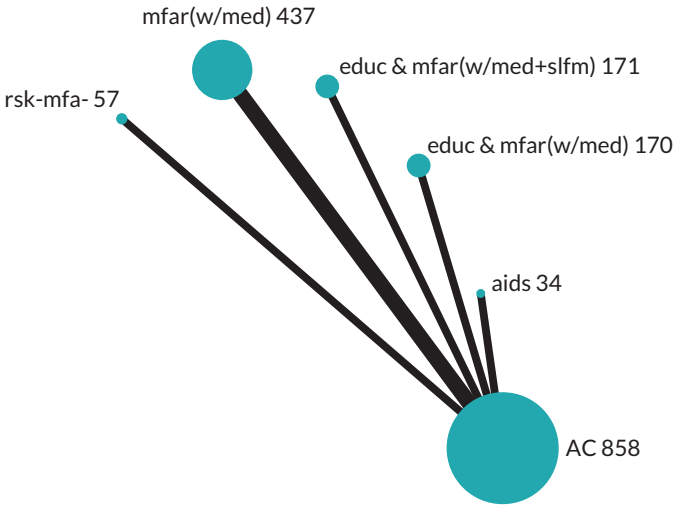
Long-term time frame

Six studies and five intervention groups were analysed in the long-term IADL available-care network, incorporating 1727 participants (see *Table 12* for a summary of findings).[73,115,136,155,162,172] The available-care node was the largest (n = 858) and aids the smallest (n = 34).

The network contained no loops and, therefore, the consistency assumption could not be tested and a 'consistency' model was fitted. Between-study variance was estimated to be very small but non-zero, indicating some degree of heterogeneity between studies included in the network ($\tau = 5.31 \times 10^{-6}$). There was moderate-certainty evidence that multifactorial-action and review with medication-review was associated with a very slight reduction in IADL independence (SMD −0.08, 95% CI −0.21 to 0.05). There was low-certainty evidence that risk-screening (SMD 0.23, 95% CI −0.13 to 0.60); and

TABLE 12 Instrumental activities of daily living in the long term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: IADL (higher is better)
Time frame: Long term; range of follow-up 24–36 months
Setting: Community
Total studies: 6
Total participants: 1727
Comparator rank: Mean 3.4, 95% CI 2 to 5



Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Lawton IADL 0–8)[a]			
Multifactorial-action and review with medication-review [mfar(w/med)]	SMD 0.08 lower (0.21 lower to 0.05 higher) Mixed estimate	MD 0.21 lower (0.56 lower to 0.13 higher)	⊕⊕⊕⊖Moderate[b]	4.5 (3 to 6)	Probably results in a very slight reduction in IADL
Risk-screening (rsk-mfa-)	SMD 0.23 higher (0.13 lower to 0.60 higher) Mixed estimate	MD 0.61 higher (0.35 lower to 1.57 higher)	⊕⊕⊖⊖Low[c]	1.7 (1 to 5)	May result in a slight increase in IADL
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]	SMD 0.14 higher (0.08 lower to 0.36 higher) Mixed estimate	MD 0.37 higher (0.21 lower to 0.95 higher)	⊕⊕⊖⊖Low[c]	2.1 (1 to 5)	May result in a very slight increase in IADL
Education, multifactorial-action and review with medication-review and self-management [educ & mfar(w/med + slfm)]	SMD 0.21 lower (0.44 lower to 0.01 higher) Mixed estimate	MD 0.56 lower (1.14 lower to 0.02 higher)	⊕⊕⊖⊖Low[b,d]	5.5 (4 to 6)	May result in a slight reduction in IADL
Aids (aids)	SMD 0.03 lower (0.48 lower to 0.42 higher) Mixed estimate	MD 0.07 lower (1.25 lower to 1.10 higher)	⊕⊖⊖⊖Very low[e,f]	3.8 (1 to 6)	The evidence is very uncertain about the effect on IADL

a Calculated from the estimated SMD using a SD of 2.62, the pooled SD across intervention groups reporting the Lawton IADL.
b Serious concerns about imprecision as CI crosses the no effect line and includes substantial harm. Downgrade once.
c Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
d Serious concerns about RoB due to missing outcome data. Downgrade once.
e Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.
f Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.

education, multifactorial-action and review with medication-review (SMD 0.14, 95% CI −0.08 to 0.36) each increased IADL independence (slightly and very slightly, respectively). There was low-certainty evidence that education, multifactorial-action and review with medication-review and self-management (SMD −0.21, 95% CI −0.44 to 0.01) was associated with a slight reduction in IADL independence.

For the long-term IADL available-care network, the 95% CI for the true ranking placed ac 2nd–5th, multifactorial-action and review with medication-review in the bottom four, and education, multifactorial-action and review with medication-review and self-management in the bottom three. For the other three interventions, the 95% CI covered at least five of the six places.

Across time frame

There was moderate-certainty evidence that multifactorial-action and review with medication-review was associated with a very slight increase in IADL independence in the medium term but also a very slight reduction in IADL in the long term. There was low-certainty evidence that education, multifactorial-action and review with medication-review and self-management was associated with a slight reduction in IADL independence in the short and long term.

Homecare network

Short-term time frame

In the short-term IADL homecare network, there were a total of four studies and five intervention groups, with the homecare node having the largest number of participants (n = 301) and homecare, multifactorial-action and review the smallest (n = 121; see *Table 13* for a summary of findings).[65,87,117,146,147] Three study populations were frail and one was pre-frail and frail. Two results were at high RoB (serious concerns) and two results were rated as some concerns.

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. As the network contained only a single study for each comparison, there was no potential source of heterogeneity and therefore a common-effect model was fitted.

One comparison with homecare had low certainty. Homecare, ADL, multifactorial-action and review with self-management may result in little to no difference in IADL independence (SMD −0.02, 95% CI −0.33 to 0.29; low certainty). There were no serious concerns about RoB but the CIs for all estimated effects included benefit and harm.

There was little difference in the mean rank of intervention groups.

Medium-term time frame

Overall characteristics

For the medium-term IADL homecare network there were six studies (n = 1401) and five intervention groups (see *Appendix 3*, *Table 24* for a summary of findings).[68,131,146,147,154,189] The largest node was homecare (n = 489). Within the network the number of participants ranged from 48 (homecare and aids) to 367 (homecare, multifactorial-action and review with medication-review) excluding the homecare comparator. All participant populations were frail. All results were at high RoB (four: serious concerns, two: very serious concerns), primarily due to missing outcome data.

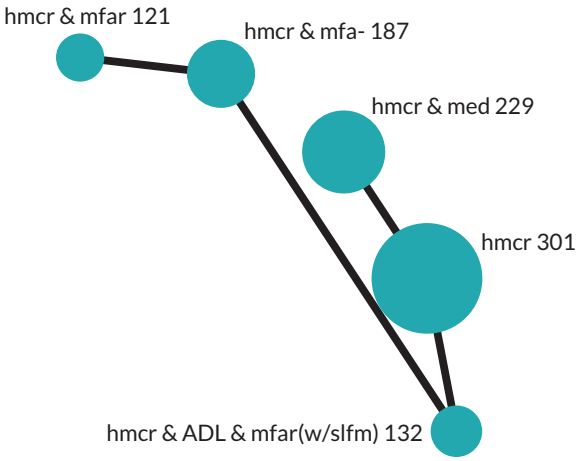
Main analysis

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. Between-study variance was estimated to be small but non-zero, indicating some degree of heterogeneity between studies included in the network (τ = 0.141). All comparisons with homecare were rated very low certainty due to serious RoB and very serious imprecision.

For the medium-term IADL homecare network, the 95% CI for the true rank covered at least five of the six positions for all intervention groups.

TABLE 13 Instrumental activities of daily living in the short term: comparisons with homecare summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Formal homecare (hmcr)
Outcome: Independence in IADL (higher is better)
Time frame: Short term; range of follow-up 6–7 months
Setting: Community
Total studies: 4
Total participants: 970
Comparator rank: Mean 2.5, 95% CI 1 to 4



Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Lawton IADL 0–8)[a]			
Homecare, ADL, multifactorial-action and review with self-management [hmcr & ADL & mfar(w/slfm)]	SMD 0.02 lower (0.33 lower to 0.29 higher) Mixed estimate	MD 0.06 lower (0.88 lower to 0.76 higher)	⊕⊕⊖⊖Low[b]	2.8 (1 to 5)	May result in little to no difference in IADL independence
Homecare, multifactorial-action and review (hmcr & mfar)	SMD 0.04 higher (0.51 lower to 0.58 higher) Indirect estimate	MD 0.09 higher (1.33 lower to 1.52 higher)	⊕⊖⊖⊖Very low[b,c]	2.4 (1 to 5)	The evidence is very uncertain about the effect on IADL independence
Homecare and multifactorial-action (hmcr & mfa-)	SMD 0.07 lower (0.55 lower to 0.42 higher) Indirect estimate	MD 0.18 lower (1.44 lower to 1.09 higher)	⊕⊖⊖⊖Very low[b,d]	3.4 (1 to 5)	The evidence is very uncertain about the effect on IADL independence
Homecare and medication-review (hmcr & med)	SMD 0.13 lower (0.31 lower to 0.06 higher) Mixed estimate	MD 0.33 lower (0.82 lower to 0.15 higher)	⊕⊖⊖⊖Very low[b,e]	3.9 (1 to 5)	The evidence is very uncertain about the effect on IADL independence

a Calculated from the estimated SMD using a SD of 2.62, the pooled SD across intervention groups reporting the Lawton IADL.
b Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
c Serious concerns about RoB due to missing outcome data in indirect evidence via the homecare, ADL, multifactorial-action and review with self-management vs. homecare and multifactorial-action comparison. Downgrade once.
d Serious concerns about RoB due to missing outcome data. Downgrade once.
e Serious concerns about RoB because multiple analyses were conducted but the results from only one analysis were reported. Downgrade once.

Investigation of small-study effects

There were fewer than 10 studies in the network so small-study effects were not investigated.

Sensitivity analysis for risk of bias

For the medium-term IADL homecare network, Parsons M 2017[146] and Rooijackers 2021[154] were dropped from the network, leaving four studies and three nodes and leading to a disconnected network.

Investigation of frailty

Because all study populations were categorised as frail it was not possible to investigate the effects of frailty for this analysis.

Long-term time frame

It was not possible to conduct analysis of IADL in the long term for the homecare network as it only had two intervention groups.[146,147]

Across Time frames

The only evidence that was not very uncertain was from the short-term time frame.

Independence in personal activities of daily living

Continuous PADL outcomes were analysed using the SMD. Where necessary, scales were transformed so that greater scores equated to greater independence in PADL. For each time frame there were two separate networks, one with available-care reference comparator and one with a homecare comparator, which we describe in turn. We did not analyse combined PADL and IADL measures; study results are provided in *Report Supplementary Material 9*.

Available-care network

Short-term time frame

A total of eight trials (*n* = 4075 participants) compared a short-term PADL outcome across nine intervention groups including ac, which was the largest node (see *Table 14* for a summary of findings).[69,79,99,136,152,166,168,186] There was a maximum of one trial for a single direct comparison (compared to ac), with the number of participants within any one intervention group in the network ranging from 24 to 1983. All studies were at high RoB (five serious concerns, three very serious concerns).

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted, setting the inconsistency parameter in the model to zero for all comparisons. The network also contained only a single study for each comparison; hence there was no potential source of heterogeneity and, therefore, a common-effect model was fitted.

All but one comparison with ac was judged of very low certainty. Education, multifactorial-action and review with medication-review and self-management may result in a slight reduction in PADL independence (SMD −0.25, 95% CI −0.47 to −0.03; low certainty).

The 95% CI for the true ranking placed ac 4th–8th (of nine); and education, multifactorial-action and review with medication-review and self-management in the bottom four intervention groups. ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management ranked in the top two and multifactorial-action and review with self-management ranked in the top four, although note that for these intervention groups the evidence from their comparison with ac was very low certainty.

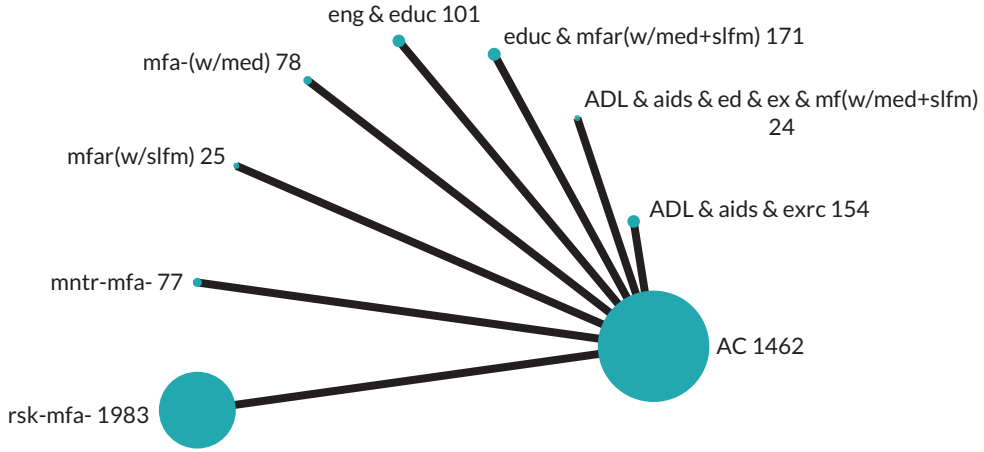
Medium-term time frame

Overall characteristics

A total of 20 trials (*n* = 8583 participants) compared a medium-term PADL outcome across 16 intervention groups including ac, which was the largest node (see *Table 15* for a summary of findings).[69,70,73–75,79,86,88,96,108,118,136,138,142,152,155,157,167,168,177] There was a maximum of four trials for a single direct comparison [multifactorial-action and review with medication-review vs. ac], with the number of participants within any one intervention group in the network ranging from 23 to 4080. The

TABLE 14 Personal activities of daily living in the short term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Independence in PADL
Time frame: Short term; range of follow-up 24 weeks to 9 months
Setting: Community
Total studies: 8
Total participants: 4075
Comparator rank: Mean 5.6, 95% CI 4 to 8



Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Barthel Index 0–100)[a]			
Education, multifactorial-action and review with medication-review and self-management [educ & mfar(w/med + slfm)]	SMD 0.25 lower (0.47 lower to 0.03 lower) Mixed estimate	MD 7.34 lower (13.91 lower to 0.76 lower)	⊕⊕⊖⊖Low[b,c]	8.4 (6 to 9)	May result in a slight reduction in PADL independence
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management [ADL&aids&ed&ex&mf(w/med + slfm)]	SMD 0.87 higher (0.21 higher to 1.54 higher) Mixed estimate	MD 25.81 higher (6.17 higher to 45.46 higher)	⊕⊖⊖⊖Very low[b,d]	1.4 (1 to 2)	The evidence is very uncertain about the effect on PADL independence
Multifactorial-action and review with self-management [mfar(w/slfm)]	SMD 0.67 higher (0.09 higher to 1.26 higher) Mixed estimate	MD 19.94 higher (2.67 higher to 37.21 higher)	⊕⊖⊖⊖Very low[e,f]	1.8 (1 to 4)	The evidence is very uncertain about the effect on PADL independence
ADL, aids and exercise (ADL & aids & exrc)	SMD 0.14 higher (0.09 lower to 0.36 higher) Mixed estimate	MD 4.03 higher (2.68 lower to 10.74 higher)	⊕⊖⊖⊖Very low[b,g]	3.7 (2 to 7)	The evidence is very uncertain about the effect on PADL independence
Risk-screening (rsk-mfa-)	SMD 0.03 higher (0.06 lower to 0.11 higher) Mixed estimate	MD 0.75 higher (1.71 lower to 3.21 higher)	⊕⊖⊖⊖Very low[h,i]	4.9 (3 to 7)	The evidence is very uncertain about the effect on PADL independence

continued

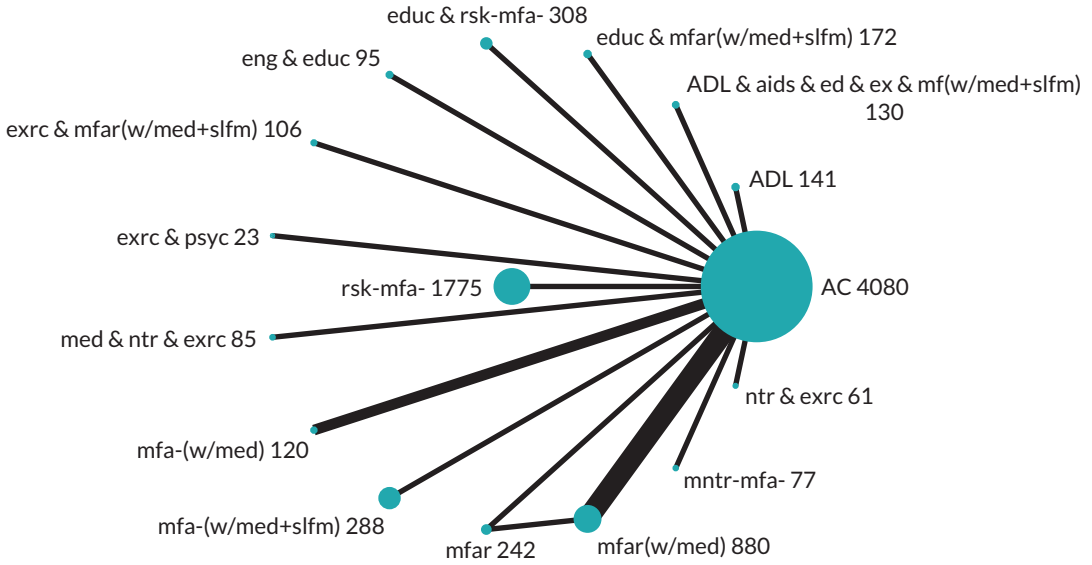
TABLE 14 Personal activities of daily living in the short term: comparisons with ac summary of findings table (*continued*)

Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Barthel Index 0–100)[a]			
Engagement in meaningful-activities and education (eng & educ)	SMD 0.00 (0.24 lower to 0.24 higher) Mixed estimate	MD 0.00 (7.07 lower to 7.07 higher)	⊕⊖⊖⊖Very low[i,j]	5.5 (3 to 9)	The evidence is very uncertain about the effect on PADL independence
Monitoring (mntr-mfa-)	SMD 0.09 lower (0.40 lower to 0.21 higher) Mixed estimate	MD 2.76 lower (11.79 lower to 6.28 higher)	⊕⊖⊖⊖Very low[b,d]	6.7 (3 to 9)	The evidence is very uncertain about the effect on PADL independence
Multifactorial-action with medication-review [mfa-(w/med)]	SMD 0.11 lower (0.44 lower to 0.21 higher) Mixed estimate	MD 3.38 lower (12.94 lower to 6.18 higher)	⊕⊖⊖⊖Very low[b,d]	7.0 (3 to 9)	The evidence is very uncertain about the effect on PADL independence

a Calculated from the estimated SMD using a SD of 29.6, the pooled SD across intervention groups reporting the Barthel Index.
b Serious concerns about RoB due to missing outcome data. Downgrade once.
c Serious concerns about imprecision as there is no closed loop and direct evidence is based on 316 persons which does not meet optimal information size. Downgrade once.
d Very serious concerns about imprecision as there is no closed loop and direct evidence is based on 40 persons which does not meet optimal information size. Downgrade twice.
e Very serious concerns about RoB because of missing data and multiple analyses being conducted but the results from only one analysis reported. Downgrade twice.
f Very serious concerns about imprecision as there is no closed loop and direct evidence is based on 48 persons which does not meet optimal information size. Already downgraded twice, downgrade once.
g Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
h Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.
i Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.
j Very serious concerns about RoB due to randomisation process, missing outcome data and reported results not being analysed according to allocation. Downgrade twice.

TABLE 15 Personal activities of daily living in the medium term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: PADL (higher is better)
Time frame: Medium term; range of follow-up 10–18 months
Setting: Community
Total studies: 20
Total participants: 8583
Comparator rank: Mean 9.2, 95% CI 6 to 12



Intervention group	Anticipated absolute effect (95% CI) SMD	MD (Barthel Index 0–100)[a]	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Exercise, multifactorial-action and review with medication-review and self-management [exrc & mfar(w/med + slfm)]	SMD 0.16 higher (0.51 lower to 0.82 higher) Mixed estimate	MD 4.68 higher (15.01 lower to 24.37 higher)	⊕⊕⊖⊖Low[b]	6.6 (1 to 16)	May result in a very slight increase in PADL independence
Multifactorial-action with medication-review [mfa-(w/med)]	SMD 0.51 higher (0.00 to 1.02 higher) Mixed estimate	MD 15.08 higher (0.14 lower to 30.30 higher)	⊕⊖⊖⊖Very low[c,d,e]	2.9 (1 to 10)	The evidence is very uncertain about the effect on PADL independence
Medication-review, nutrition and exercise (med & ntr & exrc)	SMD 0.31 higher (0.37 lower to 0.99 higher) Mixed estimate	MD 9.27 higher (10.81 lower to 29.36 higher)	⊕⊖⊖⊖Very low[b,c]	5.3 (1 to 15)	The evidence is very uncertain about the effect on PADL independence
ADL (ADL)	SMD 0.22 higher (0.42 lower to 0.87 higher) Mixed estimate	MD 6.64 higher (12.55 lower to 25.84 higher)	⊕⊖⊖⊖Very low[b,c]	6.3 (1 to 15)	The evidence is very uncertain about the effect on PADL independence

continued

TABLE 15 Personal activities of daily living in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Barthel Index 0–100)[a]			
Risk-screening (rsk-mfa-)	SMD 0.13 higher (0.48 lower to 0.75 higher) Mixed estimate	MD 3.86 higher (14.34 lower to 22.06 higher)	⊕⊖⊖⊖Very low[f,g]	7.4 (1 to 16)	The evidence is very uncertain about the effect on PADL independence
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management [ADL&aids&ed&ex&mf(w/med + slfm)]	SMD 0.07 higher (0.59 lower to 0.73 higher) Mixed estimate	MD 2.07 higher (17.33 lower to 21.47 higher)	⊕⊖⊖⊖Very low[b,c]	8.1 (1 to 16)	The evidence is very uncertain about the effect on PADL independence
Multifactorial-action and review with medication-review [mfar(w/med)]	SMD 0.05 higher (0.26 lower to 0.36 higher) Mixed estimate	MD 1.40 higher (7.71 lower to 10.51 higher)	⊕⊖⊖⊖Very low[b,c]	8.4 (3 to 14)	The evidence is very uncertain about the effect on PADL independence
Exercise and psychology (exrc & psyc)	SMD 0.00 (0.78 lower to 0.78 higher) Mixed estimate	MD 0.00 (23.09 lower to 23.09 higher)	⊕⊖⊖⊖Very low[g,h]	9.0 (1 to 16)	The evidence is very uncertain about the effect on PADL independence
Nutrition and exercise (ntr & exrc)	SMD 0.00 (0.70 lower to 0.70 higher) Mixed estimate	MD 0.00 (20.65 lower to 20.65 higher)	⊕⊖⊖⊖Very low[b,c]	9.1 (1 to 16)	The evidence is very uncertain about the effect on PADL independence
Multifactorial-action with medication-review and self-management [mfa-(w/med + slfm)]	SMD 0.04 lower (0.66 lower to 0.58 higher) Mixed estimate	MD 1.18 lower (19.60 lower to 17.24 higher)	⊕⊖⊖⊖Very low[f,g]	9.5 (2 to 16)	The evidence is very uncertain about the effect on PADL independence
Education and risk-screening (educ & rsk-mfa-)	SMD 0.03 lower (0.66 lower to 0.60 higher) Mixed estimate	MD 0.95 lower (19.56 lower to 17.66 higher)	⊕⊖⊖⊖Very low[g,i]	9.6 (2 to 16)	The evidence is very uncertain about the effect on PADL independence
Engagement in meaningful-activities and education (eng & educ)	SMD 0.05 lower (0.71 lower to 0.61 higher) Mixed estimate	MD 1.42 lower (20.87 lower to 18.03 higher)	⊕⊖⊖⊖Very low[g,j]	10.1 (2 to 16)	The evidence is very uncertain about the effect on PADL independence
Monitoring (mntr-mfa-)	SMD 0.17 lower (0.85 lower to 0.51 higher) Mixed estimate	MD 5.14 lower (25.30 lower to 15.02 higher)	⊕⊖⊖⊖Very low[b,c]	10.9 (3 to 16)	The evidence is very uncertain about the effect on PADL independence

TABLE 15 Personal activities of daily living in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Barthel Index 0–100)[a]			
Multifactorial-action and review (mfar)	SMD 0.14 lower (0.65 lower to 0.36 higher) Mixed estimate	MD 4.21 lower (19.14 lower to 10.72 higher)	⊕⊖⊖⊖Very low[b,c]	11.2 (3 to 16)	The evidence is very uncertain about the effect on PADL independence
Education, multifactorial-action and review with medication-review and self-management [educ & mfar(w/med + slfm)]	SMD 0.27 lower (0.92 lower to 0.38 higher) Mixed estimate	MD 7.91 lower (27.09 lower to 11.27 higher)	⊕⊖⊖⊖Very low[b,c]	12.5 (3 to 16)	The evidence is very uncertain about the effect on PADL independence

a Calculated from the estimated SMD using a SD of 29.6, the pooled SD across intervention groups reporting the Barthel Index.
b Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
c Serious concerns about RoB due to missing outcome data. Downgrade once.
d Serious concerns about imprecision as CI crosses the no effect line and includes substantial benefit. Downgrade once.
e Serious concerns about inconsistency (heterogeneity) between studies as CIs do not overlap. Downgrade once.
f Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.
g Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.
h Very serious concerns about RoB due to excluding participants in per-protocol analysis and missing outcome data. Downgrade twice.
i Very serious concerns about RoB due to missing data and ceiling effect in the outcome measurement for a substantial proportion of participants. Downgrade twice.
j Very serious concerns about RoB due to randomisation process, missing outcome data and reported results were not analysed according to allocation. Downgrade twice.

populations of three studies spanned all frailty categories, one study was of a robust population, six a frail population, eight studies covered the other categories and two were unclassifiable. We had some concerns about RoB in two studies with the remainder at high risk of bias (12 serious concerns, 6 very serious concerns).

Main analysis

The consistency assumption was found to hold for the network according to both the global Wald test ($p = 0.473$) and the node-splitting method (all contrasts $p > 0.05$). Between-study variance was estimated to be moderate indicating potentially large heterogeneity between studies reporting the same contrasts included in the network ($\tau = 0.310$). One comparison was judged low certainty. Exercise, multifactorial-action and review with medication-review and self-management may result in a very slight increase in PADL (SMD 0.16, 95% CI −0.51 to 0.82). The other comparisons with ac were of very low certainty.

In the available-care network for the medium-term PADL outcome, ac ranked 6th–12th, multifactorial-action with medication-review ranked highest (95% CI 1 to 10). Other rankings had even wider CIs.

Investigation of small-study effects

The comparison-adjusted funnel plot appeared symmetric, implying no evidence of small-study effects in the network.

Sensitivity analysis for risk of bias

In sensitivity analysis, six trials were excluded due to very serious concerns about RoB and this left 14 trials included in the NMA. The network contained no loops as seen in the short-term network, and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. Results were very similar as to the main analysis, with most point estimates being identical and the CI marginally wider. None of the changes affected our confidence in the estimates.

Investigation of frailty

A total of 18 trials remained in the NMA that were classifiable for frailty. All frailty categories were represented in the network and a network meta regression model was fitted including the frailty variable with 'all (robust, pre-frail and frail)' set as the reference category. The consistency assumption remained valid (global Wald test $p = 0.99$, node-splitting method showed all contrasts $p > 0.05$). Between-study variance remained very small, but non-zero ($\tau = 6.64 \times 10^{-7}$). Frailty effects could not be estimated for most contrasts due to collinearity. Where frailty effects could be estimated (multifactorial-action and review; multifactorial-action and review with medication-review; and risk-screening, vs. ac), the effects were estimated with large uncertainty, with a 95% CIs covering both beneficial and harmful effects (e.g. for available-care vs. risk-screening SMD −0.031, 95% CI −68.04 to 67.98) making interpretation of these results meaningless in practice.

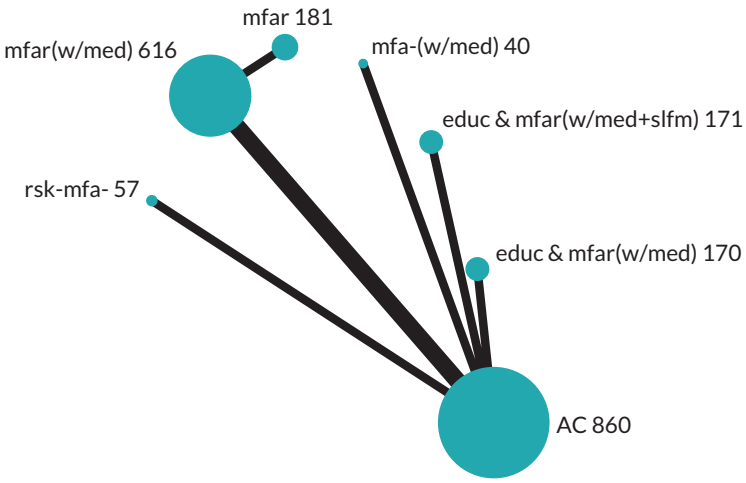
Long-term time frame

A total of seven trials ($n = 2095$ participants) compared a long-term PADL outcome across seven intervention groups including ac, which was the largest node (see *Table 16* for a summary of findings).[66,73,115,118,136,155,162] There were a maximum of two trials for a single direct comparison (multifactorial-action and review with medication-review compared to ac), with the number of participants within any one intervention group in the network ranging from 40 to 860. There were some concerns about RoB in three study results, the rest being at high RoB (three with serious concerns, one with very serious concerns).

The consistency assumption was tested, and no violation of assumption was found ($p = 0.736$). Between-study variance was estimated to be very small but non-zero, indicating some degree of heterogeneity between studies included in the network ($\tau = 3.87 \times 10^{-8}$). The five following comparisons

TABLE 16 Personal activities of daily living in the long term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Independence in PADL
Time frame: Long term; range of follow-up 24–36 months
Setting: Community
Total studies: 7
Total participants: 2095
Comparator rank: Mean 3.0, 95% CI 1 to 5



Intervention group	Anticipated absolute effect (95% CI) SMD	MD (Barthel Index 0–100)[a]	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]	SMD 0.11 higher (0.11 lower to 0.33 higher) Mixed estimate	MD 3.21 higher (3.33 lower to 9.75 higher)	⊕⊕⊖⊖Low[b]	1.9 (1 to 5)	May result in a very slight increase in PADL independence
Risk-screening (rsk-mfa-)	SMD 0.06 higher (0.30 lower to 0.43 higher) Mixed estimate	MD 1.85 higher (8.92 lower to 12.63 higher)	⊕⊕⊖⊖Low[b]	2.5 (1 to 6)	May result in a very slight increase in PADL independence
Multifactorial-action and review with medication-review [mfar(w/med)]	SMD 0.03 lower (0.16 lower to 0.10 higher) Mixed estimate	MD 0.79 lower (4.66 lower to 3.08 higher)	⊕⊕⊖⊖Low[b]	3.5 (1 to 5)	May result in little to no difference in PADL independence
Education, multifactorial-action and review with medication-review and self-management [educ & mfar(w/med + slfm)]	SMD 0.27 lower (0.50 lower to 0.05 lower) Mixed estimate	MD 8.07 lower (14.65 lower to 1.49 lower)	⊕⊕⊖⊖Low[c,d]	5.8 (4 to 7)	May result in a slight reduction in PADL independence
Multifactorial-action and review (mfar)	SMD 0.37 lower (0.62 lower to 0.13 lower) Indirect estimate	MD 11.06 lower (18.34 lower to 3.79 lower)	⊕⊕⊖⊖Low[c,e]	6.5 (5 to 7)	May result in a slight reduction in PADL independence
Multifactorial-action with medication-review mfa-(w/med)	SMD 0.17 lower (0.60 lower to 0.25 higher) Mixed estimate	MD 5.09 lower (17.66 lower to 7.48 higher)	⊕⊖⊖⊖Very low[f,g]	4.8 (1 to 7)	The evidence is very uncertain about the effect on PADL independence

a Calculated from the estimated SMD using a SD of 29.6, the pooled SD across intervention groups reporting the Barthel Index.
b Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
c Serious concerns about RoB due to missing outcome data. Downgrade once.
d Serious concerns about imprecision as no closed loop and direct comparison is based on 316 persons which does not meet optimal information size. Downgrade once.
e Serious concerns about imprecision as no closed loop and comparison is based on 360 persons in link between multifactorial-action and review and multifactorial-action and review with medication-review which does not meet optimal information size. Downgrade once.
f Very serious concerns about RoB due to randomisation process, deviations from the intended interventions and missing data. Downgrade twice.
g Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.

with ac were judged low certainty. Education, multifactorial-action and review with medication-review may result in a very slight increase in PADL independence (SMD 0.11, 95% CI −0.11 to 0.33), as may risk-screening (SMD 0.06, 95% CI −0.30 to 0.43). Multifactorial-action and review with medication-review may result in little to no difference in PADL independence (SMD −0.03, 95% CI −0.16 to 0.10). Education, multifactorial-action and review with medication-review and self-management may result in a slight reduction in PADL independence (SMD −0.27, 95% CI −0.50 to −0.05). Multifactorial-action and review may also result in a slight reduction in PADL independence in the long term (SMD −0.37, 95% CI −0.62 to −0.13).

Available care; education, multifactorial-action and review with medication-review; and multifactorial-action and review with medication-review were all ranked in the top five according to the 95% CI for the true ranking. Education, multifactorial-action and review with medication-review and self-management; and multifactorial-action and review, had 95% CIs of four to seven and five to seven, respectively.

Across time frames

There was low-certainty evidence that education, multifactorial-action and review with medication-review and self-management [educ & mfar(w/med + slfm)] may result in a slight reduction in PADL independence in both the short- and long-term time frames.

Homecare network

Short-term time frame

A total of four trials (n = 775 participants) compared a short-term PADL outcome across five intervention groups including homecare, which was the largest node (see *Table 17* for a summary of findings).[65,91,117,169] There was a maximum of one trial for a single direct comparison (compared to homecare), with the number of participants within any one intervention group in the network ranging from 29 to 378.

The consistency assumption was tested, and no violation of assumption was found (p = 0.904). Homecare, ADL, multifactorial-action and review with self-management may result in a very slight increase in PADL independence (SMD 0.11, 95% CI −0.20 to 0.43; low certainty). Other comparisons with homecare were rated as very low certainty.

The 95% CI for the true ranking covered at least four of the five places for all intervention groups.

Medium-term time frame

Overall characteristics

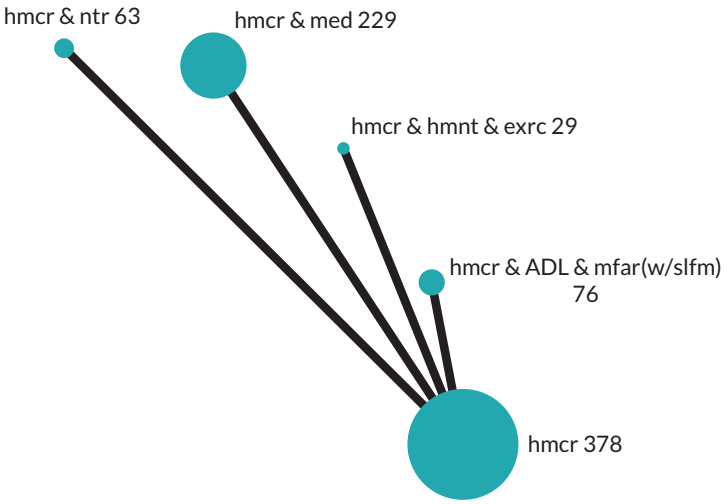
Four trials (n = 632 participants) compared a medium-term PADL outcome across five intervention groups including homecare, which was the largest node (see *Table 18* for a summary of findings).[68,91,154,169] There was a maximum of one trial for a single direct comparison (compared to homecare), with the number of participants within any one intervention group in the network ranging from 29 to 133, excluding homecare. All study populations were frail and all were at high RoB, primarily due to missing data (three with serious concerns, one with very serious concerns).

Main analysis

The consistency assumption was found to hold for the network according to both the global Wald test (p = 0.407) and the node-splitting method (all contrasts $p > 0.05$). As the network contained only a single study measuring each comparison, there was no potential source of heterogeneity and, therefore, a common-effect model was fitted. Homecare, multifactorial-action and review with medication-review may result in an increase in PADL [SMD 0.60 (moderate), 95% CI 0.32 to 0.88; low certainty]. All other comparisons with homecare were rated as very low certainty.

TABLE 17 Personal activities of daily living in the short term: comparisons with homecare summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Formal homecare (hmcr)
Outcome: Independence in PADL
Time frame: Short term; range of follow-up 6–7 months
Setting: Community
Total studies: 4
Total participants: 775
Comparator rank: Mean 3.4, 95% CI 2 to 5



Intervention group	Anticipated absolute effect (95% CI) SMD	MD (Barthel Index 0–100)[a]	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Homecare, ADL, multifactorial-action and review with self-management [hmcr & ADL & mfar(w/slfm)]	SMD 0.11 higher (0.20 lower to 0.43 higher) Mixed estimate	MD 3.32 higher (5.95 lower to 12.59 higher)	⊕⊕⊖⊖Low[b]	2.4 (1 to 5)	May result in a very slight increase in PADL independence
Homecare and nutrition (hmcr & ntr)	SMD 0.13 higher (0.24 lower to 0.51 higher) Mixed estimate	MD 3.92 higher (7.20 lower to 15.05 higher)	⊕⊖⊖⊖Very low[b,c]	2.3 (1 to 5)	The evidence is very uncertain about the effect on PADL independence
Homecare, alternative-medicine and exercise (hmcr & hmnt & exrc)	SMD 0.03 higher (0.48 lower to 0.55 higher) Mixed estimate	MD 0.91 higher (14.32 lower to 16.15 higher)	⊕⊖⊖⊖Very low[b,c]	3.0 (1 to 5)	The evidence is very uncertain about the effect on PADL independence
Homecare and medication-review (hmcr & med)	SMD 0.05 lower (0.23 lower to 0.14 higher) Mixed estimate	MD 1.44 lower (6.92 lower to 4.03 higher)	⊕⊖⊖⊖Very low[b,d]	3.9 (2 to 5)	The evidence is very uncertain about the effect on PADL independence

a Calculated from the estimated SMD using a SD of 29.6, the pooled SD across intervention groups reporting the Barthel Index.
b Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
c Serious concerns about RoB due to missing outcome data. Downgrade once.
d Serious concerns about RoB because multiple analyses were conducted but the results from only one analysis were reported. Downgrade once.

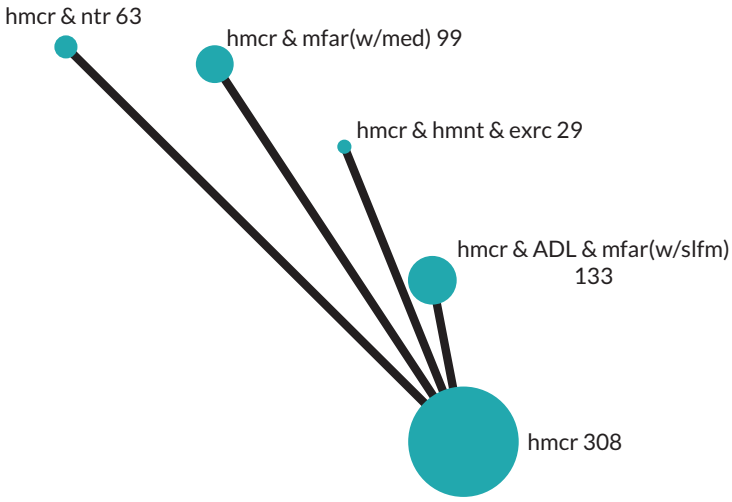
In the homecare network for the medium-term PADL outcome, homecare, multifactorial-action and review with medication-review ranked highest (95% CI 1 to 2), and homecare was ranked lowest (95% CI 3 to 5); the ranking of the other three intervention groups had wide CIs.

Investigation of small-study effects

There were fewer than 10 studies in the network so small-study effects were not investigated.

TABLE 18 Personal activities of daily living in the medium term: comparisons with homecare summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Formal homecare (hmcr)
Outcome: PADL (higher is better)
Time frame: Medium term; follow-up at 12 months
Setting: Community
Total studies: 4
Total participants: 632
Comparator rank: Mean 4.4, 95% CI 3 to 5



Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Barthel Index 0–100)[a]			
Homecare, multifactorial-action and review with medication-review [hmcr & mfar(w/med)]	SMD 0.60 higher (0.32 higher to 0.88 higher) Mixed estimate	MD 17.74 higher (9.32 higher to 26.15 higher)	⊕⊕⊖⊖Low[b,c]	1.1 (1 to 2)	May result in an increase in PADL
Homecare and nutrition (hmcr & ntr)	SMD 0.23 higher (0.15 lower to 0.60 higher) Mixed estimate	MD 6.70 higher (4.45 lower to 17.85 higher)	⊕⊖⊖⊖Very low[b,d]	2.7 (1 to 5)	The evidence is very uncertain about the effect on PADL
Homecare, ADL, multifactorial-action and review with self-management [hmcr & ADL & mfar(w/slfm)]	SMD 0.12 higher (0.13 lower to 0.36 higher) Mixed estimate	MD 3.42 higher (3.73 lower to 10.57 higher)	⊕⊖⊖⊖Very low[e,f]	3.4 (2 to 5)	The evidence is very uncertain about the effect on PADL
Homecare, alternative-medicine and exercise (hmcr & hmnt & exrc)	SMD 0.10 higher (0.42 lower to 0.61 higher) Mixed estimate	MD 2.83 higher (12.41 lower to 18.08 higher)	⊕⊖⊖⊖Very low[b,d]	3.4 (1 to 5)	The evidence is very uncertain about the effect on PADL

a Calculated from the estimated SMD using a SD of 29.6, the pooled SD across intervention groups reporting the Barthel Index.
b Serious concerns about RoB due to missing outcome data. Downgrade once.
c Serious concerns about imprecision as no closed loop and direct evidence is based on 99 persons in homecare, multifactorial-action and review with medication-review which does not meet optimal information size. Downgrade once.
d Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
e Very serious concerns about RoB due to missing outcome data and because reported results were not analysed in accordance with the protocol. Downgrade twice.
f Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.

Sensitivity analysis for risk of bias

In sensitivity analysis, one trial was excluded due to very serious concerns about RoB and this left three trials included in the NMA. The consistency assumption was tested and no violation of assumption was found (p = 0.775). Results were very similar to the main analysis, with the same estimate for homecare, multifactorial-action and review with medication-review compared to homecare in both direct and indirect comparisons.

Investigation of frailty
No frailty analysis was possible as the populations in all studies were classified as frail.

Long-term time frame
There were insufficient studies in the homecare network to conduct analyses of long-term PADL outcomes.

Across time frames
There was no high- or moderate-certainty evidence, and low-certainty evidence was identified for one time frame at most for each intervention group.

Hospitalisation

Hospitalisation included hospital inpatient care usage over the follow-up period, which was reported in terms of number of persons admitted, the length of stay in hospital or the frequency of admissions. For the hospitalisation outcome we analysed data on participants hospitalised once or more in the medium term. ORs were estimated in the NMA for the odds of a person having at least one hospitalisation between two intervention groups. An OR smaller than one indicates that the estimated effect favours the experimental intervention group, that is a decrease of odds of any hospitalisation with intervention.

Seventeen studies reported usable data; however, two were in the homecare network and disconnected from the available-care network.[68,125] Therefore, we only present the results from an available-care network.

Overall characteristics
There were 15 studies (n = 9569) and 10 intervention groups (see *Table 19* for a summary of findings).[73,75,104,108,109,118,124,143,144,149,155,168,178,180,181] Four studies compared multifactorial-action and review with medication-review versus ac, three studies compared multifactorial-action and review versus ac, the other eight comparisons had data from a single study. Four study populations included all frailty categories, one was robust, one pre-frail, four frail and three a combination of pre-frail and frail categories. We had some concerns with RoB in six study results and nine were judged high RoB (five with serious concerns, four with very serious concerns).

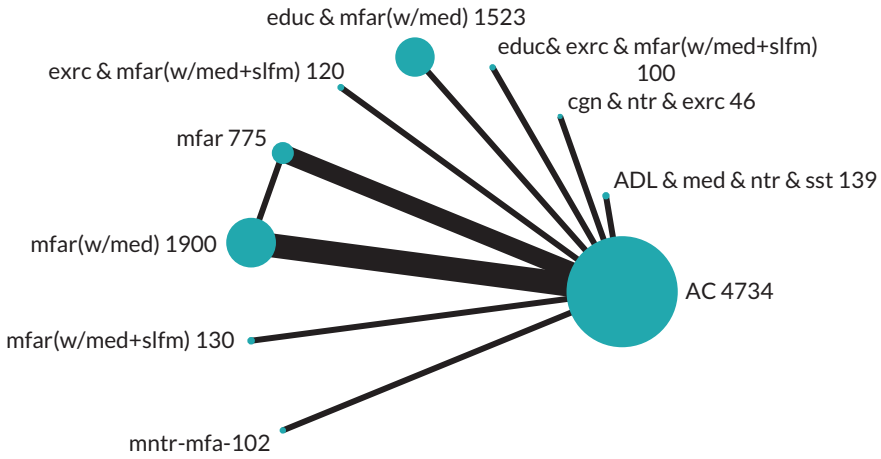
Main analysis
The consistency assumption was found to hold for the network according to both the global Wald test (p = 0.378) and the node-splitting method (all contrasts $p > 0.05$). Between-study variance was estimated to be very small but non-zero, indicating some degree of heterogeneity between studies included in the network ($\tau = 1.57 \times 10^{-6}$).

Three comparisons with ac were rated low certainty. Education, exercise, multifactorial-action and review with medication-review and self-management may result in a reduction in odds of being hospitalised [OR 0.53 (very large), 95% CI 0.25 to 1.12]. Similarly, education, multifactorial-action and review with medication-review may result in a slight reduction in odds of being hospitalised (OR 0.92, 95% CI 0.78 to 1.09). However, exercise, multifactorial-action and review with medication-review and self-management may result in an increase in odds of being hospitalised [OR 1.34 (large), 95% CI 0.80 to 2.24]. The other six comparisons with ac were rated very low certainty.

Investigation of small-study effects
The comparison-adjusted funnel plot appeared symmetric, implying no evidence of small-study effects in the network.

TABLE 19 Hospitalisation in the medium term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Hospitalisation
Time frame: Medium term; range of follow-up 12–18 months
Setting: Community
Total studies: 15
Total participants: 9569
Comparator rank: Mean 4.4, 95% CI 5 to 8



	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population [520 per 1000 with ac]		Low-risk population [118 per 1000 with ac]		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Intervention	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Education, exercise, multifactorial-action and review with medication-review and self-management strategies [educ & exrc & mfar(w/med + slfm)]	OR 0.53 (0.25 to 1.12) Mixed estimate	RR 0.59 (0.30 to 1.09)	365 per 1000 (213 to 549)	155 fewer per 1000 (307 fewer to 29 more)	66 per 1000 (32 to 131)	52 fewer per 1000 (86 fewer to 13 more)	⊕⊕⊖⊖ Low[b]	1.4 (5 to 10)	May result in a reduction in chance of being hospitalised
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]	OR 0.92 (0.78 to 1.09) Mixed estimate	RR 0.94 (0.82 to 1.07)	499 per 1000 (457 to 542)	21 fewer per 1000 (63 fewer to 22 more)	110 per 1000 (94 to 127)	8 fewer per 1000 (24 fewer to 9 more)	⊕⊕⊖⊖ Low[c]	3.3 (5 to 9)	May result in a slight reduction in chance of being hospitalised
Exercise, multifactorial-action and review with medication-review and self-management strategies [exrc & mfar(w/med + slfm)]	OR 1.34 (0.80 to 2.24) Mixed estimate	RR 1.24 (0.84 to 1.75)	592 per 1000 (465 to 708)	72 more per 1000 (55 fewer to 188 more)	152 per 1000 (97 to 231)	34 more per 1000 (21 fewer to 113 more)	⊕⊕⊖⊖ Low[d]	7.0 (1 to 8)	May result in an increase in chance of being hospitalised

TABLE 19 Hospitalisation in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population [520 per 1000 with ac]		Low-risk population [118 per 1000 with ac]				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Multifactorial-action and review (mfar)	OR 0.81 (0.62 to 1.06) Mixed estimate	RR 0.85 (0.67 to 1.05)	467 per 1000 (400 to 535)	53 fewer per 1000 (120 fewer to 15 more)	98 per 1000 (76 to 124)	20 fewer per 1000 (42 fewer to 6 more)	⊕⊖⊖⊖ Very low[c,e]	2.4 (6 to 10)	The evidence is very uncertain about the effect on chance of being hospitalised
Multifactorial-action and review with medication-review [mfar(w/med)]	OR 1.10 (0.95 to 1.28) Mixed estimate	RR 1.08 (0.96 to 1.20)	544 per 1000 (507 to 581)	24 more per 1000 (13 fewer to 61 more)	129 per 1000 (113 to 146)	11 more per 1000 (5 fewer to 28 more)	⊕⊖⊖⊖ Very low[c,e]	5.7 (3 to 8)	The evidence is very uncertain about the effect on chance of being hospitalised
Multifactorial-action and review with medication-review and self-management strategies [mfar(w/med + slfm)]	OR 1.37 (0.76 to 2.50) Mixed estimate	RR 1.27 (0.80 to 1.86)	598 per 1000 (450 to 731)	78 more per 1000 (70 fewer to 211 more)	155 per 1000 (92 to 251)	37 more per 1000 (26 fewer to 133 more)	⊕⊖⊖⊖ Very low[f,g]	6.7 (1 to 9)	The evidence is very uncertain about the effect on chance of being hospitalised
Monitoring (mntr-mfa-)	OR 1.39 (0.80 to 2.42) Mixed estimate	RR 1.28 (0.84 to 1.83)	602 per 1000 (466 to 724)	82 more per 1000 (54 fewer to 204 more)	157 per 1000 (97 to 244)	39 more per 1000 (21 fewer to 126 more)	⊕⊖⊖⊖ Very low[h,i]	7.0 (1 to 9)	The evidence is very uncertain about the effect on chance of being hospitalised
ADL, medication-review, nutrition and social skills (ADL & med & ntr & sst)	OR 1.70 (0.93 to 3.09) Mixed estimate	RR 1.46 (0.95 to 2.09)	648 per 1000 (503 to 770)	128 more per 1000 (17 fewer to 250 more)	185 per 1000 (111 to 293)	67 more per 1000 (7 fewer to 175 more)	⊕⊖⊖⊖ Very low[j,k]	8.1 (1 to 7)	The evidence is very uncertain about the effect on chance of being hospitalised
Cognitive training, nutrition and exercise (cgn & ntr & exrc)	OR 3.30 (0.63 to 17.30) Mixed estimate	RR 2.16 (0.69 to 3.67)	781 per 1000 (405 to 949)	261 more per 1000 (115 fewer to 429 more)	306 per 1000 (78 to 698)	188 more per 1000 (40 fewer to 580 more)	⊕⊖⊖⊖ Very low[h,l]	9.0 (1 to 9)	The evidence is very uncertain about the effect on chance of being hospitalised

continued

TABLE 19 Hospitalisation in the medium term: comparisons with ac summary of findings table (*continued*)

	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population [520 per 1000 with ac]		Low-risk population [118 per 1000 with ac]				
Intervention	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation

a Calculated from OR and an assumed comparator risk of 0.228, the median ac risk among these studies.
b Very serious concerns about imprecision as CI includes substantial benefit and harm, and as no closed loop and direct comparison is based on 35 events from 200 persons which does not meet optimal information size. Downgrade twice.
c Very serious concerns about imprecision as CI includes substantial benefit and harm. Downgrade twice.
d Very serious concerns about imprecision as CI includes substantial harm and harm, and as no closed loop and direct comparison is based on 140 events from 241 persons which does not meet optimal information size. Downgrade twice.
e Serious concerns about RoB mainly due to missing outcome data among the studies. Downgrade once.
f Very serious concerns about RoB due to the recruitment process of participants and missing data. Downgrade twice.
g Very serious concerns about imprecision as CI includes substantial benefit and harm, and as no closed loop and direct comparison is based on 52 events from 299 persons which does not meet optimal information size. Already downgraded twice for risk of bias, downgrade once.
h Serious concerns about RoB due to missing outcome data. Downgrade once.
i Very serious concerns about imprecision as CI includes substantial benefit and harm, and as no closed loop and direct comparison is based on 98 events from 205 persons which does not meet optimal information size. Downgrade twice.
j Very serious concerns about RoB due to substantial number of missing outcome data. Downgrade twice.
k Very serious concerns about imprecision as CI includes substantial benefit and harm, and as no closed loop and direct comparison is based on 55 events from 281 persons which does not meet optimal information size. Already downgraded twice for risk of bias, downgrade once.
l Very serious concerns about imprecision as CI includes substantial benefit and harm, and as no closed loop and direct comparison is based on eight events from 95 persons which does not meet optimal information size. Downgrade twice.

Sensitivity analysis for risk of bias

After removing the four study results with very serious concerns about RoB, there were 11 remaining results (n = 6896) and 8 intervention groups in the sensitivity analysis. Results were very similar to those from the main analysis for the intervention groups that remained in the sensitivity analysis, with no change in certainty of evidence.

Investigation of frailty

All frailty categories were represented in the network and a network meta regression model was fitted including the frailty variable with 'all (robust, pre-frail and frail)' set as the reference category. The consistency assumption remained valid (global Wald test p = 0.791, node-splitting method showed all contrasts $p > 0.05$). Between-study variance remained very small, but non-zero ($\tau = 1.58 \times 10^{-7}$). Frailty effects could not be estimated for most contrasts due to collinearity. Where frailty effects could be estimated, the effect was estimated with very large uncertainty as reflected in wide 95% CIs covering a broad range of both beneficial and harmful effects making interpretation of these results meaningless in practice.

Care-home placement

Care-home placement included long-term nursing-home and residential-home admissions. In the NMA, ORs were estimated to compare the odds of care-home placement between two arms. OR smaller than one means the estimated effect favours the experimental intervention group, that is a decrease in risk of care-home placement with intervention. For each time frame, there were two separate networks, one with ac reference comparator and another with homecare comparator, which we describe in turn.

Available-care network

Short-term time frame

The ac network for care-home placement in the short term comprised seven studies (n = 3672) and eight intervention groups (see *Appendix 3*, *Table 25* for a summary of findings).[113,121,126,136,165,166,190] Each comparison had data from a single study only. Two study populations included all frailty categories, two included pre-frail and frail categories, two were frail and one was unclassifiable for frailty. We had some concerns about RoB in one study result, the other study results were judged high RoB (four with serious concerns, two with very serious concerns), primarily due to the proportion of missing outcome data compared with the number of care-home placements.

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. As the network contained only a single study for each comparison, there was no potential source of heterogeneity and therefore a common-effect model was fitted.

All comparisons with ac were rated as very low certainty. There was very serious imprecision throughout the network as there were data for only 30 care-home placements in total.

Medium-term time frame

The ac network for care-home placement in the medium term comprised 20 studies (n = 16,055) and 14 intervention groups (see *Appendix 3*, *Table 26* for a summary of findings).[70,88,103,104,106–108,116,118,119,121,136,138,142,143,150,153,158,165,178] Five studies compared multifactorial-action and review with medication-review versus ac, two comparisons had data from two studies and the other 11 comparisons had one. Four study populations included all frailty categories, one was robust, one pre-frail, six included the pre-frail and frail categories and five were frail, with three unclassifiable. All study results were judged high RoB, primarily due to the proportion of missing outcome data compared with the number of care-home placements; we had serious concerns regarding 16 and very serious concerns regarding 4.

The consistency assumption was found to hold for the network according to both the global Wald test (p = 0.823) and the node-splitting method (all contrasts $p > 0.05$). Between-study variance was estimated to be non-zero, indicating some degree of heterogeneity between studies included in the network (τ = 0.244).

All comparisons with ac were rated as very low certainty. In addition to the high RoB, there was very serious imprecision throughout the network as there were data for only 300 care-home placements across the 14 comparisons.

Sensitivity analysis for risk of bias and small-study effects

The results of the sensitivity analysis were very similar to those of the main analysis for the intervention groups that remained in the network.

Investigation of frailty

All frailty categories were represented in the network and a network meta regression model was fitted including the frailty variable with 'all (robust, pre-frail and frail)' set as the reference category. The consistency assumption remained valid (global Wald test p = 0.884, node-splitting method showed all contrasts $p > 0.05$). Between-study variance was very small but remained non-zero ($\tau = 2.05 \times 10^{-5}$). Frailty effects could not be estimated for most contrasts due to collinearity. Where frailty effects could be estimated, the effect was estimated with very large uncertainty as reflected in wide 95% CIs covering a broad range of both beneficial and harmful effects making interpretation of these results meaningless in practice.

Long-term time frame

The ac network for care-home placement in the long term comprised 14 studies (n = 13,638) and 10 intervention groups (see *Table 20* for a summary of findings).[76,92,93,106,116,118,121,136,162,164,165,171–173] Four studies compared multifactorial-action and review with medication-review versus ac, two comparisons had data from two studies and the others had one. Four study populations included all frailty categories, one included robust and pre-frail categories, one was pre-frail, four included pre-frail and frail categories, three were frail and one was unclassifiable. We had some concerns with RoB in one study; the others were judged high RoB (eleven with serious concerns, two with very serious concerns).

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted, setting the inconsistency parameter in the model to zero for all comparisons. Between-study variance was estimated to be very small but non-zero, indicating some degree of heterogeneity between studies included in the network ($\tau = 5.18 \times 10^{-6}$).

Risk-screening may result in an increase in care-home placement in the long term, in comparison with ac [OR 1.41 (large), 95% CI 1.06 to 1.88; low certainty]. We rated the eight other comparisons with ac as very low certainty.

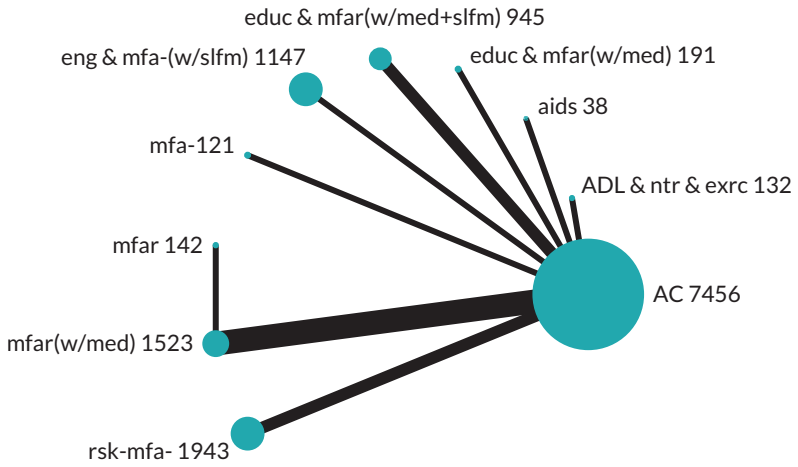
Risk-screening was ranked in the bottom half of intervention groups according to the 95% CI for the true ranking (6 to 10). Other CIs were wider than this.

Summary across time frames

Proportions of participants placed in a care home were relatively low. Therefore, small numbers of missing outcome data (including mortality) often placed the results at high RoB due to its large proportion with comparison to care-home placement. Low numbers also resulted in wide CIs across the estimates. Only one comparison with ac was not very low certainty, which indicated that risk-screening may result in an increase in care-home placement in the long term (large effect).

TABLE 20 Care-home placement in the long term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Care-home placement
Time frame: Long term; range of follow-up 24–48 months
Setting: Community
Total studies: 14
Total participants: 13,638
Comparator rank: Mean 5.4, 95% CI 3 to 8



	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (200 per 1000 with ac)		Low-risk population (7 per 1000 with ac)				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Risk-screening (rsk-mfa-)	OR 1.41 (1.06 to 1.88) Mixed estimate	RR 1.39 (1.06 to 1.82)	261 per 1000 (209 to 319)	61 more per 1000 (9 more to 119 more)	10 per 1000 (7 to 13)	3 more per 1000 (0 to 6 more)	⊕⊕⊖⊖Low[b,c]	8.4 (6 to 10)	May result in an increase in care-home placement
Multifactorial-action and review (mfar)	OR 0.41 (0.07 to 2.26) Indirect estimate	RR 0.42 (0.08 to 2.16)	93 per 1000 (18 to 361)	107 fewer per 1000 (182 fewer to 161 more)	3 per 1000 (1 to 16)	4 fewer per 1000 (6 fewer to 9 more)	⊕⊖⊖⊖Very low[d,e]	3.1 (1 to 10)	The evidence is very uncertain about the effect on care-home placement
Aids (aids)	OR 0.40 (0.04 to 3.97) Mixed estimate	RR 0.41 (0.04 to 3.58)	90 per 1000 (10 to 498)	110 fewer per 1000 (190 fewer to 298 more)	3 per 1000 (0 to 27)	4 fewer per 1000 (7 fewer to 20 more)	⊕⊖⊖⊖Very low[f,g]	3.3 (1 to 10)	The evidence is very uncertain about the effect on care-home placement
ADL, nutrition and exercise (ADL & ntr & exrc)	OR 0.79 (0.32 to 1.98) Mixed estimate	RR 0.80 (0.32 to 1.91)	165 per 1000 (73 to 331)	35 fewer per 1000 (127 fewer to 131 more)	6 per 1000 (2 to 14)	1 fewer per 1000 (5 fewer to 7 more)	⊕⊖⊖⊖Very low[b,e]	4.6 (1 to 10)	The evidence is very uncertain about the effect on care-home placement

continued

TABLE 20 Personal activities of daily living in the short term: comparisons with ac summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population(200 per 1000 with ac)		Low-risk population(7 per 1000 with ac)				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]	OR 0.77 (0.25 to 2.33) Mixed estimate	RR 0.78 (0.26 to 2.22)	161 per 1000 (60 to 369)	39 fewer per 1000 (140 fewer to 169 more)	5 per 1000 (2 to 16)	2 fewer per 1000 (5 fewer to 9 more)	⊕⊖⊖⊖Very low[b,e]	4.6 (1 to 10)	The evidence is very uncertain about the effect on care-home placement
Multifactorial-action (mfa-)	OR 0.65 (0.07 to 6.34) Mixed estimate	RR 0.66 (0.07 to 5.30)	140 per 1000 (17 to 613)	60 fewer per 1000 (183 fewer to 413 more)	5 per 1000 (0 to 43)	2 fewer per 1000 (7 fewer to 36 more)	⊕⊖⊖⊖Very low[b,e]	4.7 (1 to 10)	The evidence is very uncertain about the effect on care-home placement
Multifactorial-action and review with medication-review [mfar(w/med)]	OR 1.08 (0.72 to 1.62) Mixed estimate	RR 1.08 (0.73 to 1.58)	212 per 1000 (153 to 288)	12 more per 1000 (47 fewer to 88 more)	8 per 1000 (5 to 11)	1 more per 1000 (2 fewer to 4 more)	⊕⊖⊖⊖Very low[b,e]	6.2 (3 to 10)	The evidence is very uncertain about the effect on care-home placement
Engagement in meaningful-activities and multifactorial-action with self-management strategies [eng & mfa-(w/slfm)]	OR 1.21 (0.79 to 1.86) Mixed estimate	RR 1.20 (0.79 to 1.80)	232 per 1000 (165 to 317)	32 more per 1000 (35 fewer to 117 more)	8 per 1000 (6 to 13)	1 more per 1000 (1 fewer to 6 more)	⊕⊖⊖⊖Very low[b,e]	7.3 (3 to 10)	The evidence is very uncertain about the effect on care-home placement
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	OR 1.26 (0.67 to 2.37) Mixed estimate	RR 1.25 (0.68 to 2.25)	240 per 1000 (144 to 372)	40 more per 1000 (56 fewer to 172 more)	9 per 1000 (5 to 16)	2 more per 1000 (2 fewer to 9 more)	⊕⊖⊖⊖Very low[g,h]	7.4 (3 to 10)	The evidence is very uncertain about the effect on care-home placement

a Calculated from OR and an assumed comparator risk of 0.037, the median ac risk among these studies.
b Serious concerns about RoB due to missing outcome data. Downgrade once.
c Serious concerns about inconsistency (heterogeneity) between studies as their point estimates indicate benefit and harm, respectively. Although CIs overlap it is only moderate. I^2 = 56% Downgrade once.
d Serious concerns about RoB due to missing outcome data in the indirect evidence via multifactorial-action and review with medication-review vs. ac comparison. Downgrade once.
e Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
f Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.
g Very serious concerns about imprecision as confidence interval includes substantial benefit and harm. Already downgraded twice for risk of bias, downgrade once.
h Very serious concerns about RoB due to deviations from the intended interventions and missing data. Downgrade twice.

Homecare network

There were insufficient data to conduct NMA for homecare interventions in the short- and long-term time frames. We therefore present results for the medium-term time frame only.

Medium-term time frame

The homecare network for care-home placement comprised four studies (n = 1567) and five intervention groups, with each comparison including data from a single study only (see *Appendix 3*, *Table 27* for a summary of findings).[91,125,154,189] All four study populations were frail. We judged each study result to be at high RoB (three with serious concerns, one with very serious concerns).

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. As the network contained only a single study for each comparison, there was no potential source of heterogeneity and therefore a common-effect model was fitted.

All comparisons with ac were rated very low certainty due to the RoB and very serious imprecision.

Investigation of small-study effects

There were fewer than 10 studies in the network so small-study effects were not investigated.

Sensitivity analysis for risk of bias

The results of the sensitivity analysis were very similar to those of the main analysis for the intervention groups that remained in the network.

Investigation of frailty

Because all study populations were categorised as frail it was not possible to investigate the effects of frailty for this analysis.

Homecare services (non-healthcare professional) usage

Homecare is often provided to enable a person to remain living at home but can be considered costly and a potential limiter of opportunities for activity and agency.[593] Therefore, while some interventions explicitly intended to reduce homecare usage, others consider it an appropriate outcome of assessment and care planning. Sixteen studies reported results regarding the usage of homecare services provided by non-healthcare professionals. Data on two metrics were collected: number of participants using the services at the time, and volume of usage in terms of visits or hours of homecare. These study results are presented in *Report Supplementary Material 9*. These data were not meta-analysed because of a sparse and disconnected network formed for each of the three time periods. We have summarised results based on direction rather than significance and indicated the RoB in the result. We had very serious concerns over the RoB in the results from two studies; therefore, they are not summarised here.

Available-care comparisons

There was lower usage of homecare for four groups assigned to interventions that were compared with ac: ADL, nutrition and exercise in the medium and long term (no serious concerns);[121] education and risk-screening in the medium term (serious concerns);[138] exercise in the long term (no serious concerns);[184] exercise and multifactorial-action with medication-review in the long term (no serious concerns).[127]

There was higher usage of homecare for five groups assigned to interventions that were compared with ac: education, multifactorial-action and review with medication-review and self-management in the long term (serious concerns);[136] multifactorial-action with medication-review in the medium term (serious concerns);[142] multifactorial-action and review with medication-review in the long term (no serious concerns);[73] and two groups assigned to risk-screening in the medium and long term (serious concerns).[116,148]

Participants receiving welfare rights advice in Howel 2019[112] were less likely to be using homecare in the long term than those in the ac group (serious concerns). However, among those using homecare, the welfare group received more hours of care per week such that hours per participant across the whole sample were very similar between groups.

Thomas 2007[171] compared ac with two experimental interventions classified in the same intervention group: multifactorial-action and review with medication-review; one in which advice was given and one in which referrals were offered to the participant. Compared to ac they found higher homecare usage in the group given advice and similar and lower usage in the referrals group in the medium and long term, respectively (serious concerns).

Interventions where all participants received homecare at enrolment

Bernabei 1998[68] compared homecare, multifactorial-action and review with medication-review to homecare and found lower use in the medium term (serious concerns).

King 2012[117] evaluated a form of restorative homecare (homecare, ADL, multifactorial-action and review with self-management). This group received slightly fewer visits per month, but the duration of each visit was slightly longer compared with usual homecare in the short term (no serious concerns).

Whitehead 2016[187] compared two 6-week homecare reablement services: homecare, ADL, aids and multifactorial-action versus homecare and multifactorial-action. They found a lower proportion of homecare users in the homecare and multifactorial-action group in the short term, but this was accounted for by mortality (serious concerns).

Summary of results for main outcomes synthesised with NMA

Table 21 summarises the evidence for our main outcomes with moderate- or low-certainty GRADE ratings (there was no high-certainty evidence) for which NMA was conducted.

Health status/health-related quality of life

We meta-analysed single global self-assessments of health status using the SMD (unless results were presented as binary data). Health status was treated as a positive outcome, so a positive SMD indicates benefit.

Overall characteristics

There were eight studies and seven intervention groups connected with medium-term self-reported health results with ac as a reference comparator (see *Appendix 3*, *Table 28*).[70,73–75,157,167,168,171] A ninth study reported results but was disconnected from the network. There were a total of 2631 participants across this network with ac the largest intervention group (n = 1499) and nutrition and exercise the smallest (n = 61). Three studies compared multifactorial-action and review with medication-review to ac, the other comparisons were populated by one study each. The population of one study covered all frailty levels, one population was pre-frail, three study populations were pre-frail and frail and three were frail. We had some concerns about RoB in the results of one study and the others were high RoB (six with serious concerns, one with very serious concerns), primarily due to missing outcome data.

Main analysis

The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. Between-study variance was estimated to be small but non-zero, indicating some degree of heterogeneity between studies included in the network (τ = 0.0995). There was low-certainty evidence that exercise, multifactorial-action and review with medication-review and

TABLE 21 Summary of moderate- and low-certainty evidence for main outcomes synthesised with NMA

Intervention group[a]	LAH T1	LAH T2	LAH T3	IADL T1	IADL T2	IADL T3	PADL T1	PADL T2	PADL T3	Hosp T2	CH T1	CH T2	CH T3
ADL, aids, education, exercise, multifactorial-action and review (with medication-review and self-management) [ADL&aids&ed&ex&mf(w/med + slfm)]					⊕⊕⊖⊖ ---								
ADL, aids and exercise (ADL & aids & exrc)					⊕⊕⊖⊖ --								
ADL, nutrition and exercise (ADL & ntr & exrc)	⊕⊕⊖⊖ ~	⊕⊕⊖⊖ ++++	⊕⊕⊖⊖ ++										
Cognitive training, medication-review, nutrition and exercise (cgn & med & ntr & exrc)		⊕⊕⊖⊖ ++++											
Education, exercise, multifactorial-action and review with medication-review and self-management strategies [educ & exrc & mfar(w/med + slfm)]										⊕⊕⊖⊖ -----			
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]		⊕⊕⊖⊖ -	⊕⊕⊖⊖ +++			⊕⊕⊖⊖ +			⊕⊕⊖⊖ +	⊕⊕⊖⊖ --			
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	⊕⊕⊖⊖ ---	⊕⊕⊖⊖ -----		⊕⊕⊖⊖ --		⊕⊕⊖⊖ --	⊕⊕⊖⊖ --		⊕⊕⊖⊖ --				
Exercise, multifactorial-action and review (with medication-review and self-management) [exrc & mfar(w/med + slfm)]								⊕⊕⊖⊖ +		⊕⊕⊖⊖ ++++			
Engagement in meaningful-activities and multifactorial-action with self-management strategies [eng & mfa-(w/slfm)]			⊕⊕⊖⊖ +										
Multifactorial-action and review (mfar)	⊕⊕⊖⊖ +		⊕⊕⊖⊖ +++						⊕⊕⊖⊖ --				
Multifactorial-action and review with medication-review [mfar(w/med)]	⊕⊕⊖⊖ ~	⊕⊕⊕⊖ ++	⊕⊕⊖⊖ ++		⊕⊕⊕⊖ +	⊕⊕⊕⊖ -			⊕⊕⊖⊖ ~				
Multifactorial-action with medication-review [mfa-(w/med)]		⊕⊕⊖⊖ ++++											

continued

TABLE 21 Summary of moderate- and low-certainty evidence for main outcomes synthesised with NMA (*continued*)

Intervention group[a]	LAH T1	LAH T2	LAH T3	IADL T1	IADL T2	IADL T3	PADL T1	PADL T2	PADL T3	Hosp T2	CH T1	CH T2	CH T3
Risk-screening (rsk-mfa-)		⊕⊕⊖⊖ -	⊕⊕⊖⊖ --			⊕⊕⊖⊖ ++			⊕⊕⊖⊖ +				⊕⊕⊖⊖ ++++
Homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)]	⊕⊕⊖⊖ ---	⊕⊕⊖⊖ ----		⊕⊕⊖⊖ ~			⊕⊕⊖⊖ +						
Homecare and nutrition (hmcr & ntr)	⊕⊕⊖⊖ -----												
Homecare, multifactorial-action and review (with medication-review) [hmcr & mfar(w/med)]								⊕⊕⊖⊖ +++					

LAH, living at home (+ favoured); IADL, instrumental activities of daily living (+ favoured); PADL, personal activities of daily living (+ favoured); Hosp, hospitalisation (- favoured); CH, care-home placement (- favoured); T1, short-term time frame (24 weeks to 9 months); T2, medium-term time frame (> 9 months to 18 months); T3, long-term time frame (> 18 months).
⊕⊕⊕⊖, Moderate-certainty GRADE rating.
⊕⊕⊖⊖, Low-certainty GRADE rating.
+++++, very large increase; ++++, large increase; +++, moderate increase; ++, slight increase; +, very slight increase; ~, little to no difference; -, very slight reduction; --, slight reduction; ---, moderate reduction; ----, large reduction; -----, very large reduction.
a In comparison with a reference comparator. For intervention groups including homecare the reference comparator is homecare, for all other intervention groups the reference comparator is ac.

Note
Green shades indicate possible benefit, red shades indicate possible harm. Bold indicates moderate-certainty evidence.

self-management strategies may result in little to no difference in self-reported health (SMD −0.01, 95% CI −0.34 to 0.32). The other comparisons with ac were of very low certainty due to RoB and imprecision, but the point estimates of all of these were very small.

For medium-term self-reported health, the 95% CI for the ranking of ac was two to six of seven places and was wider for other interventions.

Investigation of small-study effects

There were fewer than 10 studies in the network so small-study effects were not investigated.

Sensitivity analysis for risk of bias

Only Blom 2016[70] was identified as being a very serious concern for bias, so it was dropped from the sensitivity analysis. As the network was reduced it still contained no loops and therefore the consistency assumption could not be tested. The between-study heterogeneity estimate remained the same as in the main analysis.

Multifactorial-action and review with medication-review ranked highest (95% CI for true rank 1 to 5), nutrition and exercise ranked second (95% CI for true rank 1 to 6) and monitoring ranked last (95% CI for true rank 1 to 6). No direct or indirect comparison had a statistically significant outcome.

Investigation of frailty

No studies were dropped for the frailty meta regression, however there were no studies categorised as 'robust' populations. A network meta regression model was fitted including the frailty variable with 'all (robust, pre-frail and frail)' set as the reference category. The network contained no loops and therefore the consistency assumption could not be tested and a 'consistency' model was fitted. Between-study variance remained small, but non-zero (τ = 0.032). Frailty effects could not be estimated for most contrasts due to collinearity. Where frailty effects could be estimated (multifactorial-action and review with medication-review; and nutrition and exercise vs. ac), the effects were estimated with large uncertainty, with 95% CIs covering both beneficial and harmful effects (e.g. for ac vs. nutrition and exercise SMD 0.019, 95% CI −248.25 to 248.28) making interpretation of these results meaningless in practice.

Depression

Continuous measures of depression in the medium term were included. Among these we included the five-item Mental Health Index, which is included in the 36-item Short-Form health survey, but preferred more specific and extensive measures of depression where these were also reported. Where necessary, scales were transformed so that lower scores equated to better mental health (or less depressed). There were two separate networks, one with ac reference comparator and one with a homecare comparator, which we describe in turn.

Available-care network

Overall characteristics

A total of 15 trials (n = 7245 participants) compared depression outcome across 13 treatment options including ac as largest node at medium-term follow-up (see *Appendix 3*, *Table 29* for a summary of findings).[69,70,73,75,79,83,101,108,118,136,142,155,167,168,177] There were at most two trials for a single direct comparison (multifactorial-action and review with medication-review vs. ac; and multifactorial-action and review vs. ac), with the number of participants receiving any one treatment in the network ranging from 23 to 3387. Two study populations included all frailty categories, one population was robust, one pre-frail and four frail; five studies included the other categories and two were unclassifiable. There were some

concerns about RoB in two study results and the remainder were high RoB, primarily due to missing outcome data (eight with serious concerns, five with very serious concerns).

Main analysis

The consistency assumption was found to hold for the network according to both the global Wald test (p = 0.162) and the node-splitting method (all contrasts $p > 0.05$). Between-study variance was estimated to be non-zero indicating some degree of heterogeneity between studies included in the network (τ = 0.105).

There was low-certainty evidence that exercise, multifactorial-action and review with medication-review and self-management may result in a very slight reduction in symptoms of depression (SMD −0.11, 95% CI −0.45 to 0.23). The remaining comparisons with ac were of very low certainty.

The CIs for the true ranking were wide, covering at least 11 of the 13 places for all intervention groups except ac (mean rank 7.6; 95% CI of the true rank 5 to 11).

Investigation of small-study effects

The comparison-adjusted funnel plot appeared symmetric, implying no evidence of small-study effects in the network.

Sensitivity analysis for risk of bias

In sensitivity analysis, five trials were excluded due to very serious concerns about RoB and this left ten trials included in the NMA (n = 2893 participants). The consistency assumption was tested, and no violation of assumption was found (p = 0.658). Only comparison of multifactorial-action and review with medication-review versus ac was statistically significant with wide CIs for pairwise analyses (favouring multifactorial-action and review with medication-review vs. ac) as in the main analysis and remained statistically significant after inclusion of indirect evidence in the NMA. This estimate was of moderate certainty with reduced concerns about imprecision compared to the main analysis (very low certainty). Additionally, in NMA, multifactorial-action and review with medication-review versus ac was statistically superior to other treatments.

Investigation of frailty

Thirteen trials were classifiable for frailty. All frailty categories were represented in the network and a network meta regression model was fitted including the frailty variable with 'all (robust, pre-frail and frail)' set as the reference category. The consistency assumption remained valid (global Wald test p = 0.99, node-splitting method showed all contrasts $p > 0.05$). Between-study variance remained very small, but non-zero (τ = 0.005). Frailty effects could not be estimated for most contrasts due to collinearity. Where frailty effects could be estimated (multifactorial-action and review; multifactorial-action and review with medication-review; and risk-screening vs. ac), the effects were estimated with large uncertainty, with 95% CIs covering both beneficial and harmful effects (e.g. for ac vs. risk-screening, SMD 0.026, 95% CI −150.12 to 150.17) making interpretation of these results meaningless in practice.

Homecare network

Overall characteristics

A total of six trials (n = 996 participants) compared depression outcome across seven intervention groups including homecare as largest node at medium-term follow-up (see *Appendix 3*, *Table 30* for a summary of findings).[68,91,146,147,154,169] Each direct comparison included data from only one trial, with the number of participants assigned to an intervention group ranging from 29 to 308. All participant populations were classified as frail. All study results were judged to be at high RoB (four with serious concerns, two with very serious concerns).

Main analysis

The consistency assumption was tested, and no violation of assumption was found (p = 0.254). Comparison of homecare, multifactorial-action and review with medication-review versus homecare was statistically significant with wide CIs in pairwise analysis (favouring homecare, multifactorial-action and review with medication-review), and remained statistically significant (SMD −0.38, 95% CI −0.66 to −0.10; low certainty) after inclusion of indirect evidence in the NMA. The evidence from all other comparisons with homecare was GRADEd as very low certainty.

For the medium-term depression homecare network, homecare, multifactorial-action and review with medication-review ranked first (95% CI 1 to 4) and homecare ranked second last (95% CI 3 to 7). For the other intervention groups, the 95% CI for the true rank covered at least six of the seven positions.

Investigation of small-study effects

There were fewer than 10 studies in the network so small-study effects were not investigated.

Sensitivity analysis for risk of bias

In sensitivity analysis, two trials were excluded due to very serious concerns and one which became disconnected, leaving only three trials included in the NMA (n = 368 participants). The consistency assumption was tested, and no violation of assumption was found (p = 0.793). The NMA found one SMD to be statistically significant in any comparison. As in the main analysis, only comparison of homecare, multifactorial-action and review with medication-review versus homecare, was statistically significant with wide CIs for pairwise analysis and remained statistically significant after inclusion of indirect evidence, with the same effect estimate as in the main analysis.

Investigation of frailty

All trial participants were classified as frail and therefore, no analysis of frailty was possible.

Loneliness

Six studies reported results regarding loneliness; five comparing an experimental intervention with ac[70,73,85,159,181] and one comparing two experimental interventions.[114] These data were tabulated in *Report Supplementary Material 9* but were not meta-analysed because there were only a maximum of three comparisons, each from a single study, forming a sparse network for each of the three time periods.

Loneliness was self-assessed through questionnaires. Four studies used the 11-item de Jong-Gierveld Scale;[70,73,85,181] one study[159] used the single item concerning loneliness in the Health Index developed by Hansagi and Rosenqvist;[594] one study used a bespoke three-point Likert-type scale[114]

In the short term, Jing 2018[114] found lower loneliness in the exercise and psychology group compared with the psychology group [mean 1.41 (SD 0.68) vs. mean 1.85 (SD 0.70); no serious concerns over RoB]. de Craen 2006[85] found little difference between the multifactorial-action group and ac (MD change −0.1, 95% CI −0.5 to 0.4; serious concerns over RoB). In the medium term, Bouman 2008[73] found a small, possibly unimportant reduction in loneliness in the multifactorial-action with medication-review plus self-management group compared to the ac group (MD values 0.44, 95% CI −0.37 to 1.24; serious concerns over RoB). In the long term, de Craen 2006[85] found little difference between the multifactorial-action group and ac as they did in the short term (MD change 0.0, 95% CI −0.7 to 0.6 serious concerns over RoB). van Rossum 1993[181] found a small, possibly unimportant increase in loneliness in the multifactorial-action with review group compared to ac (MD values 0.2, 95% CI −0.2 to 0.6; serious concerns over RoB). We had very serious concerns over RoB in two further results, which are therefore not summarised here.[70,159]

Falls

Falls were reported as the proportion of participants who had fallen in a given period and measures of the number of falls per participant by 23 studies. Falls results are tabulated in *Report Supplementary Material 9*. We synthesised the effect on falls using vote counting based on the direction of effect.[595] In all cases where the same study reported both a proportion of fallers and measure of falls,[86,108,146,147,187] or in different time frames,[81,118,144,154,155,165] the direction of effect was the same, therefore we have synthesised these together. We had very serious concerns regarding RoB in two results each from three studies which are therefore not reported here.[108,146,147]

Comparisons with available care

In 12 studies there was less falling in the group receiving the intervention compared to ac: ADL;[86] ADL and exercise;[97] cognitive training, nutrition and exercise;[144] education, multifactorial-action and review;[151] education and risk-screening;[138] multifactorial-action with medication-review;[142] two groups receiving multifactorial-action and review with medication-review;[74,88] multifactorial-action and review with self-management;[186] nutrition and exercise;[157] and two groups receiving risk-screening.[76,115]
In four studies there was more falling in the group receiving the intervention compared to ac: exercise, multifactorial-action and review with medication-review and self-management;[75] education, multifactorial-action and review with medication-review and self-management;[81] and two groups receiving multifactorial-action and review with medication-review.[155,165]

Other comparisons

Two studies compared homecare, ADL, multifactorial-action and review with self-management versus homecare. There was less falling in the intervention group in King 2012[117] and the control in Rooijackers 2021.[154] There was less falling in the homecare, ADL, aids and multifactorial-action group than homecare and multifactorial-action in Whitehead 2016[187] There was less falling in the multifactorial-action and review with medication-review group than multifactorial-action and review in Kono 2016.[118]

Mortality

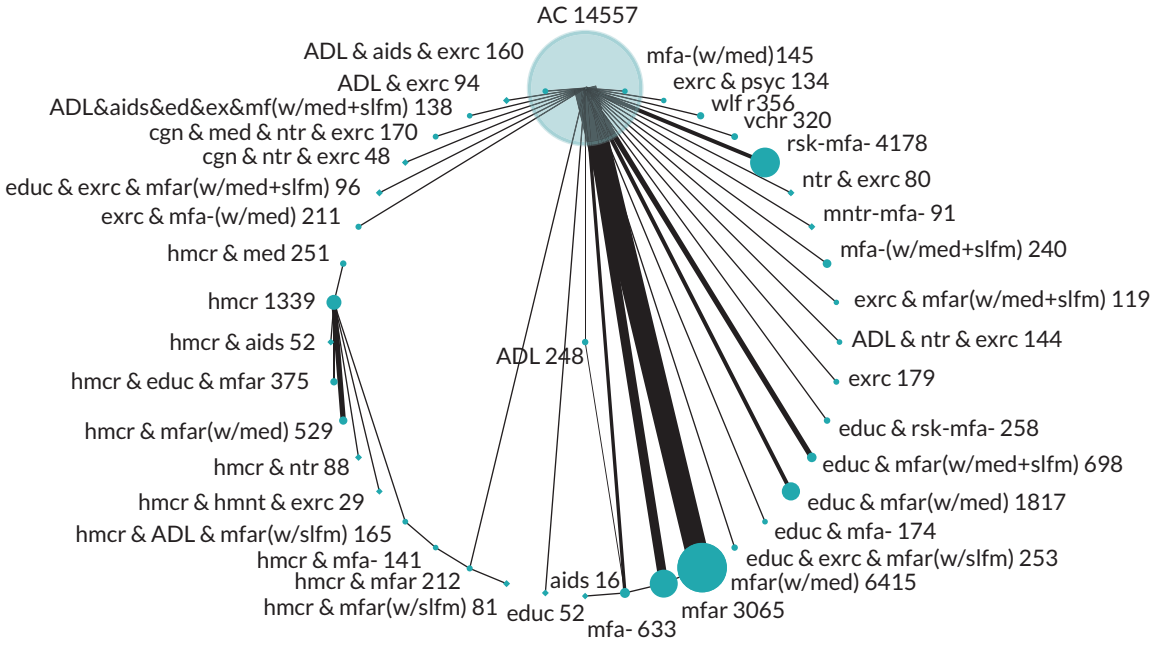
Mortality was reported as either the number of deaths over a period, or time to death measured from baseline. We analysed data on number of deaths in the medium term. ORs were estimated in the NMA for the odds of a person dying between two intervention groups. An OR smaller than 1 indicates that the estimated effect favours the experimental intervention group, that is a decreased odds of death with intervention. Unlike other NMAs in this review, all comparisons with homecare were connected to the same network as comparisons with ac.

Overall characteristics

Sixty-five studies (n = 38,351 participants) provided mortality data about 41 intervention groups in the medium term (see *Table 22* for a summary of findings).[63,65,67–71,73–75,81,82,84–86,88,91,95,97,99,102–104,106–112,116,118,119,121,124,125,127,131,134,136,138,140,142–144,146,147,150,152–155,157,158,160,165,167–169,178,181,182,188,189,191] There was a maximum of 11 trials for a single direct comparison (multifactorial-action and review with medication-review vs. ac) followed by four trials of multifactorial-action and review versus ac, with the number of participants receiving any one treatment in the network ranging from 16 (aids) to 14,557 (ac). The populations of 12 studies included all frailty levels, 1 was robust, 1 robust and pre-frail, 3 pre-frail, 13 pre-frail and frail, 25 frail and 10 were unclassifiable. The RoB in 25 of the study results was judged some concerns, with high RoB in 40 study results (32 serious concerns, 8 very serious concerns). Most notably, we had very serious concerns about the comparison of homecare and multifactorial-action and review versus ac due to missing outcome data and post-randomisation exclusions. Because this linked all other homecare comparisons with ac, there were very serious concerns about their indirect comparison with ac.

TABLE 22 Mortality in the medium term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Mortality
Time frame: Medium term; range of follow-up 12–18 months
Setting: Community
Total studies: 65
Total participants: 38,351
Comparator rank: Mean 26.0, 95% CI 18 to 31



Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (202 per 1000 with ac)		Low-risk population (7 per 1000 with ac)				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
ADL, aids and exercise (ADL & aids & exrc)	OR 0.16 (0.03 to 0.71) Mixed estimate	RR 0.17 (0.03 to 0.72)	39 per 1000 (8 to 152)	163 fewer per 1000 (194 fewer to 50 fewer)	1 per 1000 (0 to 5)	6 fewer per 1000 (7 fewer to 2 fewer)	⊕⊕⊖⊖ Low[b]	8.6 (1 to 19)	May result in a reduction in mortality
Multifactorial-action and review (mfar)	OR 0.88 (0.66 to 1.18) Mixed estimate	RR 0.88 (0.67 to 1.17)	182 per 1000 (143 to 230)	20 fewer per 1000 (59 fewer to 28 more)	7 per 1000 (5 to 9)	1 fewer per 1000 (3 fewer to 1 more)	⊕⊕⊖⊖ Low[c]	22.9 (12 to 31)	May result in a slight reduction in mortality

continued

TABLE 22 Mortality in the medium term: comparisons with ac summary of findings table (*continued*)

	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (202 per 1000 with ac)		Low-risk population (7 per 1000 with ac)				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
ADL (ADL)	OR 1.03 (0.44 to 2.43) Mixed estimate	RR 1.03 (0.45 to 2.29)	206 per 1000 (100 to 380)	5 more per 1000 (102 fewer to 179 more)	8 per 1000 (3 to 18)	0 per 1000 (4 fewer to 10 more)	⊕⊕⊖⊖ Low[c]	25.9 (12 to 37)	May result in a very slight increase in mortality
Exercise, multifactorial-action and review with medication-review and self-management strategies [exrc & mfar(w/med + slfm)]	OR 1.22 (0.50 to 3.01) Mixed estimate	RR 1.21 (0.51 to 2.77)	235 per 1000 (112 to 432)	34 more per 1000 (89 fewer to 230 more)	9 per 1000 (4 to 22)	2 more per 1000 (4 fewer to 15 more)	⊕⊕⊖⊖ Low[c]	28.6 (11 to 38)	May result in a slight increase in mortality
Multifactorial-action with medication-review [mfa-(w/med)]	OR 1.23 (0.50 to 3.04) Mixed estimate	RR 1.22 (0.51 to 2.80)	237 per 1000 (112 to 434)	35 more per 1000 (89 fewer to 233 more)	9 per 1000 (4 to 22)	2 more per 1000 (4 fewer to 15 more)	⊕⊕⊖⊖ Low[c]	28.8 (14 to 38)	May result in a slight increase in mortality
Exercise and multifactorial-action with medication-review [exrc & mfa-(w/med)]	OR 1.51 (0.25 to 9.20) Mixed estimate	RR 1.48 (0.26 to 6.83)	276 per 1000 (59 to 699)	74 more per 1000 (142 fewer to 497 more)	11 per 1000 (2 to 64)	4 more per 1000 (6 fewer to 57 more)	⊕⊕⊖⊖ Low[c]	29.7 (8 to 41)	May result in an increase in mortality
ADL and exercise (ADL & exrc)	OR 1.53 (0.41 to 5.70) Mixed estimate	RR 1.50 (0.42 to 4.75)	279 per 1000 (94 to 590)	77 more per 1000 (108 fewer to 388 more)	11 per 1000 (3 to 41)	4 more per 1000 (4 fewer to 33 more)	⊕⊕⊖⊖ Low[c]	30.9 (11 to 40)	May result in an increase in mortality
Homecare and aids (hmcr & aids)	OR 0.07 (0.00 to 1.57) Indirect estimate	RR 0.07 (0.00 to 1.53)	17 per 1000 (0 to 284)	184 fewer per 1000 (202 fewer to 82 more)	1 per 1000 (0 to 12)	7 fewer per 1000 (7 fewer to 4 more)	⊕⊖⊖⊖ Very low[d,e]	5.1 (1 to 27)	The evidence is very uncertain about the effect on mortality
Homecare, multifactorial-action and review with medication-review [hmcr & mfar(w/med)]	OR 0.10 (0.01 to 1.64) Indirect estimate	RR 0.10 (0.01 to 1.60)	25 per 1000 (3 to 293)	177 fewer per 1000 (199 fewer to 91 more)	1 per 1000 (0 to 12)	7 fewer per 1000 (7 fewer to 5 more)	⊕⊖⊖⊖ Very low[d,e]	6.0 (1 to 27)	The evidence is very uncertain about the effect on mortality
Homecare, education, multifactorial-action and review (hmcr & educ & mfar)	OR 0.12 (0.01 to 1.93) Indirect estimate	RR 0.12 (0.01 to 1.86)	29 per 1000 (3 to 328)	172 fewer per 1000 (199 fewer to 126 more)	1 per 1000 (0 to 14)	7 fewer per 1000 (7 fewer to 7 more)	⊕⊖⊖⊖ Very low[d,e]	7.7 (1 to 30)	The evidence is very uncertain about the effect on mortality

TABLE 22 Mortality in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (202 per 1000 with ac)		Low-risk population (7 per 1000 with ac)				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Homecare (hmcr)	OR 0.13 (0.01 to 1.97) Indirect estimate	RR 0.13 (0.01 to 1.89)	32 per 1000 (3 to 332)	170 fewer per 1000 (199 fewer to 131 more)	1 per 1000 (0 to 14)	6 fewer per 1000 (7 fewer to 7 more)	⊕⊖⊖⊖ Very low[d,e]	8.1 (2 to 29)	The evidence is very uncertain about the effect on mortality
Exercise (exrc)	OR 0.17 (0.02 to 1.40) Mixed estimate	RR 0.18 (0.02 to 1.38)	41 per 1000 (5 to 261)	160 fewer per 1000 (197 fewer to 60 more)	1 per 1000 (0 to 10)	6 fewer per 1000 (7 fewer to 3 more)	⊕⊖⊖⊖Very low[d,e]	9.6 (1 to 34)	The evidence is very uncertain about the effect on mortality
Homecare, multifactorial-action and review (hmcr & mfar)	OR 0.16 (0.02 to 1.58) Mixed estimate	RR 0.17 (0.02 to 1.54)	39 per 1000 (5 to 285)	163 fewer per 1000 (197 fewer to 84 more)	1 per 1000 (0 to 12)	6 fewer per 1000 (7 fewer to 4 more)	⊕⊖⊖⊖ Very low[g,h]	9.6 (2 to 28)	The evidence is very uncertain about the effect on mortality
Homecare and medication-review (hmcr & med)	OR 0.16 (0.01 to 2.68) Indirect estimate	RR 0.17 (0.01 to 2.50)	39 per 1000 (3 to 404)	163 fewer per 1000 (199 fewer to 202 more)	1 per 1000 (0 to 20)	6 fewer per 1000 (7 fewer to 12 more)	⊕⊖⊖⊖ Very low[d,e]	10.8 (2 to 34)	The evidence is very uncertain about the effect on mortality
Homecare, multifactorial-action and review with self-management strategies [hmcr & mfar(w/slfm)]	OR 0.18 (0.01 to 2.26) Indirect estimate	RR 0.19 (0.01 to 2.15)	43 per 1000 (3 to 363)	158 fewer per 1000 (199 fewer to 162 more)	1 per 1000 (0 to 17)	6 fewer per 1000 (7 fewer to 9 more)	⊕⊖⊖⊖ Very low[d,e]	10.8 (1 to 34)	The evidence is very uncertain about the effect on mortality
Nutrition and exercise (ntr & exrc)	OR 0.22 (0.01 to 4.78) Mixed estimate	RR 0.23 (0.01 to 4.12)	53 per 1000 (3 to 547)	149 fewer per 1000 (199 fewer to 345 more)	2 per 1000 (0 to 34)	6 fewer per 1000 (7 fewer to 27 more)	⊕⊖⊖⊖ Very low[i]	13.0 (1 to 39)	The evidence is very uncertain about the effect on mortality
Homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)]	OR 0.22 (0.02 to 3.01) Indirect estimate	RR 0.23 (0.02 to 2.77)	53 per 1000 (5 to 432)	149 fewer per 1000 (197 fewer to 230 more)	2 per 1000 (0 to 22)	6 fewer per 1000 (7 fewer to 15 more)	⊕⊖⊖⊖ Very low[d,e]	13.1 (5 to 35)	The evidence is very uncertain about the effect on mortality

continued

TABLE 22 Mortality in the medium term: comparisons with ac summary of findings table (*continued*)

	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (202 per 1000 with ac)		Low-risk population (7 per 1000 with ac)				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Cognitive training, nutrition and exercise (cgn & ntr & exrc)	OR 0.32 (0.01 to 8.09) Mixed estimate	RR 0.33 (0.01 to 6.22)	75 per 1000 (3 to 671)	127 fewer per 1000 (199 fewer to 470 more)	2 per 1000 (0 to 57)	5 fewer per 1000 (7 fewer to 50 more)	⊕⊖⊖⊖ Very low[e,f]	15.6 (1 to 40)	The evidence is very uncertain about the effect on mortality
Homecare and multifactorial-action (hmcr & mfa-)	OR 0.31 (0.03 to 3.46) Indirect estimate	RR 0.32 (0.03 to 3.13)	73 per 1000 (8 to 466)	129 fewer per 1000 (194 fewer to 265 more)	2 per 1000 (0 to 25)	5 fewer per 1000 (7 fewer to 18 more)	⊕⊖⊖⊖ Very low[g,h]	15.9 (7 to 37)	The evidence is very uncertain about the effect on mortality
ADL, nutrition and exercise (ADL & ntr & exrc)	OR 0.48 (0.16 to 1.46) Mixed estimate	RR 0.49 (0.17 to 1.43)	108 per 1000 (39 to 269)	93 fewer per 1000 (163 fewer to 68 more)	4 per 1000 (1 to 11)	4 fewer per 1000 (6 fewer to 3 more)	⊕⊖⊖⊖ Very low[c,f]	16.1 (4 to 33)	The evidence is very uncertain about the effect on mortality
Cognitive training, medication-review, nutrition and exercise (cgn & med & ntr & exrc)	OR 0.49 (0.18 to 1.35) Mixed estimate	RR 0.50 (0.19 to 1.33)	110 per 1000 (43 to 254)	91 fewer per 1000 (158 fewer to 53 more)	4 per 1000 (1 to 10)	4 fewer per 1000 (6 fewer to 3 more)	⊕⊖⊖⊖ Very low[c,f]	16.3 (4 to 32)	The evidence is very uncertain about the effect on mortality
Homecare, alternative-medicine and exercise (hmcr & hmnt & exrc)	OR 0.31 (0.01 to 7.00) Indirect estimate	RR 0.32 (0.01 to 5.58)	73 per 1000 (3 to 639)	129 fewer per 1000 (199 fewer to 437 more)	2 per 1000 (0 to 50)	5 fewer per 1000 (7 fewer to 42 more)	⊕⊖⊖⊖ Very low[d,e]	16.8 (2 to 40)	The evidence is very uncertain about the effect on mortality
Education, exercise, multifactorial-action and review with medication-review and self-management strategies [educ & exrc & mfar(w/ med + slfm)]	OR 0.49 (0.04 to 5.53) Mixed estimate	RR 0.50 (0.04 to 4.64)	110 per 1000 (10 to 583)	91 fewer per 1000 (192 fewer to 381 more)	4 per 1000 (0 to 40)	4 fewer per 1000 (7 fewer to 32 more)	⊕⊖⊖⊖Very low[e,f]	17.9 (1 to 40)	The evidence is very uncertain about the effect on mortality
Homecare and nutrition (hmcr & ntr)	OR 0.35 (0.02 to 6.49) Indirect estimate	RR 0.36 (0.02 to 5.27)	81 per 1000 (5 to 621)	120 fewer per 1000 (197 fewer to 419 more)	3 per 1000 (0 to 46)	5 fewer per 1000 (7 fewer to 39 more)	⊕⊖⊖⊖ Very low[d,e]	17.9 (6 to 39)	The evidence is very uncertain about the effect on mortality

TABLE 22 Mortality in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (202 per 1000 with ac)		Low-risk population (7 per 1000 with ac)				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Multifactorial-action and review with medication-review [mfar(w/med)]	OR 0.86 (0.71 to 1.05) Mixed estimate	RR 0.87 (0.72 to 1.05)	178 per 1000 (152 to 210)	23 fewer per 1000 (50 fewer to 8 more)	6 per 1000 (5 to 8)	1 fewer per 1000 (2 fewer to 0)	⊕⊖⊖⊖ Very low[c,j]	22.1 (13 to 29)	The evidence is very uncertain about the effect on mortality
Welfare rights advice (wlfr)	OR 0.80 (0.29 to 2.22) Mixed estimate	RR 0.81 (0.30 to 2.11)	168 per 1000 (68 to 359)	34 fewer per 1000 (133 fewer to 158 more)	6 per 1000 (2 to 16)	1 fewer per 1000 (5 fewer to 9 more)	⊕⊖⊖⊖ Very low[c,f]	22.7 (7 to 37)	The evidence is very uncertain about the effect on mortality
Multifactorial-action (mfa-)	OR 0.89 (0.56 to 1.43) Mixed estimate	RR 0.89 (0.57 to 1.40)	183 per 1000 (124 to 265)	18 fewer per 1000 (78 fewer to 64 more)	7 per 1000 (4 to 11)	1 fewer per 1000 (3 fewer to 3 more)	⊕⊖⊖⊖ Very low[c,f]	23.2 (11 to 34)	The evidence is very uncertain about the effect on mortality
Aids (aids)	OR 0.95 (0.05 to 17.30) Indirect estimate	RR 0.95 (0.05 to 10.24)	193 per 1000 (12 to 814)	8 fewer per 1000 (189 fewer to 612 more)	7 per 1000 (0 to 114)	0 per 1000 (7 fewer to 107 more)	⊕⊖⊖⊖ Very low[e,k]	24.6 (2 to 41)	The evidence is very uncertain about the effect on mortality
Multifactorial-action with medication-review and self-management strategies [mfa-(w/med + slfm)]	OR 1.00 (0.59 to 1.68) Mixed estimate	RR 1.00 (0.60 to 1.63)	202 per 1000 (130 to 298)	0 per 1000 (72 fewer to 96 more)	7 per 1000 (4 to 12)	0 per 1000 (3 fewer to 5 more)	⊕⊖⊖⊖Very low[l,m]	25.5 (14 to 35)	The evidence is very uncertain about the effect on mortality
Education and risk-screening (educ & rsk-mfa)	OR 1.00 (0.52 to 1.93) Mixed estimate	RR 1.00 (0.53 to 1.86)	202 per 1000 (116 to 328)	0 per 1000 (86 fewer to 126 more)	7 per 1000 (4 to 14)	0 per 1000 (4 fewer to 7 more)	⊕⊖⊖⊖ Very low[c,f]	25.9 (11 to 36)	The evidence is very uncertain about the effect on mortality
Care voucher provision (vchr)	OR 1.02 (0.59 to 1.79) Mixed estimate	RR 1.02 (0.60 to 1.73)	205 per 1000 (130 to 311)	3 more per 1000 (72 fewer to 110 more)	8 per 1000 (4 to 13)	0 per 1000 (3 fewer to 6 more)	⊕⊖⊖⊖ Very low[m,n]	25.9 (14 to 36)	The evidence is very uncertain about the effect on mortality

continued

TABLE 22 Mortality in the medium term: comparisons with ac summary of findings table (*continued*)

	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (202 per 1000 with ac)		Low-risk population (7 per 1000 with ac)				
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference	Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Risk-screening (rsk-mfa-)	OR 1.03 (0.76 to 1.37) Mixed estimate	RR 1.03 (0.77 to 1.35)	206 per 1000 (161 to 257)	5 more per 1000 (41 fewer to 55 more)	8 per 1000 (6 to 10)	0 per 1000 (2 fewer to 3 more)	⊕⊖⊖⊖ Very low[c,o]	26.4 (16 to 34)	The evidence is very uncertain about the effect on mortality
Education (educ)	OR 1.41 (0.09 to 23.20) Mixed estimate	RR 1.39 (0.09 to 11.96)	262 per 1000 (22 to 854)	61 more per 1000 (179 fewer to 653 more)	10 per 1000 (1 to 148)	3 more per 1000 (7 fewer to 140 more)	⊕⊖⊖⊖ Very low[h,p]	27.2 (3 to 41)	The evidence is very uncertain about the effect on mortality
Education, exercise, multifactorial-action and review with self-management strategies [educ & exrc & mfar(w/slfm)]	OR 1.19 (0.31 to 4.54) Mixed estimate	RR 1.18 (0.32 to 3.95)	231 per 1000 (73 to 534)	29 more per 1000 (129 fewer to 332 more)	9 per 1000 (2 to 33)	1 more per 1000 (5 fewer to 25 more)	⊕⊖⊖⊖ Very low[c,f]	27.8 (8 to 39)	The evidence is very uncertain about the effect on mortality
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]	OR 1.10 (0.73 to 1.67) Mixed estimate	RR 1.10 (0.74 to 1.62)	217 per 1000 (156 to 297)	16 more per 1000 (46 fewer to 95 more)	8 per 1000 (5 to 12)	1 more per 1000 (2 fewer to 5 more)	⊕⊖⊖⊖ Very low[c,f]	27.8 (17 to 36)	The evidence is very uncertain about the effect on mortality
Education and multifactorial-action (educ & mfa-)	OR 1.32 (0.23 to 7.39) Mixed estimate	RR 1.30 (0.24 to 5.82)	250 per 1000 (55 to 651)	48 more per 1000 (147 fewer to 449 more)	10 per 1000 (2 to 52)	2 more per 1000 (6 fewer to 45 more)	⊕⊖⊖⊖ Very low[c,f]	28.4 (7 to 40)	The evidence is very uncertain about the effect on mortality
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	OR 1.15 (0.66 to 2.01) Mixed estimate	RR 1.14 (0.67 to 1.93)	225 per 1000 (143 to 337)	23 more per 1000 (59 fewer to 135 more)	9 per 1000 (5 to 15)	1 more per 1000 (3 fewer to 7 more)	⊕⊖⊖⊖ Very low[c,f]	28.4 (16 to 36)	The evidence is very uncertain about the effect on mortality
Exercise and psychology (exrc & psyc)	OR 4.06 (0.44 to 37.10) Mixed estimate	RR 3.59 (0.45 to 14.68)	506 per 1000 (100 to 904)	305 more per 1000 (102 fewer to 702 more)	29 per 1000 (3 to 217)	22 more per 1000 (4 fewer to 209 more)	⊕⊖⊖⊖ Very low[m,q]	35.9 (15 to 41)	The evidence is very uncertain about the effect on mortality

TABLE 22 Mortality in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (202 per 1000 with ac)		Low-risk population (7 per 1000 with ac)				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Monitoring (mntr-mfa-)	OR 4.49 (1.41 to 14.30) Mixed estimate	RR 3.91 (1.39 to 9.15)	531 per 1000 (262 to 783)	330 more per 1000 (61 more to 582 more)	32 per 1000 (10 to 96)	25 more per 1000 (3 more to 89 more)	⊕⊖⊖⊖ Very low[e,f]	38.5 (32 to 41)	The evidence is very uncertain about the effect on mortality
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management strategies [ADL & aids & ed & ex & mf(w/ med + slfm)]	OR 8.25 (1.01 to 67.40) Mixed estimate	RR 6.31 (1.01 to 17.69)	676 per 1000 (203 to 944)	474 more per 1000 (2 more to 743 more)	58 per 1000 (7 to 335)	51 more per 1000 (0 to 327 more)	⊕⊖⊖⊖ Very low[e,f]	38.9 (23 to 41)	The evidence is very uncertain about the effect on mortality

a Calculated from OR and an assumed comparator risk of 0.042, the median ac risk among these studies.
b Very serious concerns about imprecision as CI is wide and direct evidence is based on 14 events from 319 persons. Downgrade twice.
c Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
d Serious concerns about RoB due to excluding participants in per-protocol analysis and missing outcome data in indirect evidence. Downgrade once.
e Extremely serious concerns about imprecision as CI is extremely wide. Downgrade twice (would be three downgrades except for additional downgrades for risk of bias).
f Serious concerns about RoB due to missing outcome data. Downgrade once.
g Very serious concerns about RoB due to excluding participants in per-protocol analysis and missing outcome data. Downgrade twice.
h Extremely serious concerns about imprecision as confidence interval is extremely wide. Downgrade once (would be three downgrades except for additional downgrades for risk of bias).
i Extremely serious concerns about imprecision as CI is extremely wide and direct evidence is based on 2 events from 172 persons. Downgrade three levels.
j Serious concerns about inconsistency (heterogeneity) between studies as CIs do not overlap. Downgrade once.
k Serious concerns about RoB due to missing outcome data in indirect evidence. Downgrade once.
l Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.
m Very serious concerns about imprecision as confidence interval includes substantial benefit and substantial harm. Already downgraded twice for risk of bias, downgrade once.
n Very serious concerns about RoB due to excluding participants from analyses, missing data and selective reporting results. Downgrade twice.
o Serious concerns about RoB due to randomisation process and missing outcome data in each of the two studies, respectively. Downgrade once.
p Very serious concerns about RoB due to contamination between the intervention arms and missing outcome data. Downgrade twice.
q Very serious concerns about RoB due to randomisation process, excluding participants in per-protocol analysis, and missing outcome data. Downgrade twice.

Main analysis

The consistency assumption was found to hold for the network according to both the global Wald test (p = 0.303) and the node-splitting method (all contrasts $p > 0.05$). Between-study variance was estimated to be non-zero, indicating some degree of heterogeneity between studies included in the network (τ = 0.0953). Seven comparisons with ac were of low certainty, the remainder were of very low certainty. ADL, aids and exercise may result in a reduction in mortality in the medium term compared with ac although the CIs were very wide, with the direct evidence being based on 14 events [OR 0.16 (very large), 95% CI 0.03 to 0.71; low certainty]. Similarly, the point estimate for multifactorial-action and review was a slight reduction in medium-term mortality but with wide CIs (OR 0.88, 95% CI 0.66 to 1.18; low certainty). ADL may result in a very slight increase in medium-term mortality (OR 1.03, 95% CI 0.44 to 2.43; low certainty). Exercise, multifactorial-action and review with medication-review and self-management strategies (OR 1.22, 95% CI 0.50 to 3.01); and multifactorial-action with medication-review (OR 1.23, 95% CI 0.50 to 3.04) may both result in a slight increase in mortality (low certainty). Exercise and multifactorial-action with medication-review [OR 1.51 (large), 95% CI 0.25 to 9.20]; and ADL and exercise [OR 1.53 (large), 95% CI 0.41 to 5.70] may both result in an increase in mortality (low certainty), though for all of these, CIs were wide (see *Table 22*).

Of the 41 intervention groups, homecare and aids; and homecare, multifactorial-action and review with medication-review were ranked first and second but with wide CIs (95% CI 1 to 27 each). ADL, aids and exercise was ranked fifth (mean 8.6, 95% CI 1 to 19). Monitoring (mean 38.5, 95% CI 32 to 41); and ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management (mean 38.9, 95% CI 23 to 41) were the bottom two ranked groups. Other groups had a middling rank, wide CI or both.

Investigation of small-study effects

The comparison-adjusted funnel plot appears symmetric, implying the absence of small-study effects in the network.

Sensitivity analysis for risk of bias

The eight study results with which we had very serious concerns regarding RoB were removed in the sensitivity analysis. This resulted in separate analyses for the ac and homecare networks which became disconnected.

For ac, 46 trials (26 comparisons) were included in NMA (n = 30,425 participants). The consistency assumption was tested, and no violation of assumption was found (p = 0.387). The estimates of effect in the sensitivity analysis were very similar for the seven comparisons with ac with low-certainty evidence in the main analysis.

In sensitivity analysis for the homecare network, 11 trials (10 comparisons) were included in NMA (n = 2479 participants). The consistency assumption was tested, and no violation of assumption was found (p = 0.914).

Investigation of frailty

All frailty categories were represented in the network and a network meta regression model was fitted including the frailty variable with 'all (robust, pre-frail and frail)' set as the reference category. The consistency assumption remained valid (global Wald test p = 0.200, node-splitting method showed all contrasts $p > 0.05$). Between-study variance remained small, but non-zero (τ = 0.149). Frailty effects could not be estimated for most contrasts due to collinearity. Where frailty effects could be estimated, the effect was estimated with very large uncertainty as reflected in wide 95% CIs covering a broad range of both beneficial and harmful effects making interpretation of these results meaningless in practice.

Chapter 5 Health economic evidence

Economic evaluation findings

Among the 129 included studies, 56 (43%) described a plan to conduct an economic evaluation. Thirty-nine studies (30%) compared at least two alternatives in an economic evaluation and reported the findings. We described and summarised the context and principal findings of these 39 reported economic evaluations in *Report Supplementary Material 11*. Fifteen studies did not report any findings;[92,95,101,102,123,130,140,154,158,167,168,176,178,179,187] and two studies detailed the cost items and estimated the experimental intervention costs but did not compare the costs with an alternative.[97,164]

The 39 studies included 27,463 older people. All studies were conducted in developed countries or regions: seven countries in Europe (the Netherlands, UK, Finland, Switzerland, Denmark, Germany, Norway; 21 studies), two North American countries (USA, Canada; 13 studies), two countries from Australasia (New Zealand, Australia; four studies) and one country and one region from Asia (Japan, Hong Kong; 3 studies); the Netherlands and USA contributed the most studies (9 each). The analytic price year (assumed to be the trial follow-up period if unclear) ranged from 1988 to 2018. Fifteen evaluations took place in the 2010s, 17 in the 2000s and 9 in the 1990s. Ten currencies were used, including the Dutch guilder (NLG), which was replaced by the Euro in 2002.

Twenty-seven intervention groups (experimental and control) were evaluated in the 39 studies. All studies compared one experimental intervention with a standard intervention or ac (control comparator), except Bleijenberg 2016[69] and Hay 1998.[106] which compared three interventions. The experimental and standard interventions were grouped into the same intervention group in two studies.[120,161]

Analytic perspectives and time horizon

Twenty-nine studies conducted the economic evaluation from the perspective of health and social care system only; nine adopted a societal perspective, which included the health and social care system perspective; one study evaluated the costs from the perspective of health and social care system and the societal perspective separately. All studies included healthcare costs and/or other sector costs. Twelve studies included the patient and family copayments (out-of-pocket expenses) for care.[74,78,86,106,132,136,146,147,161,182,186,190] Eight studies calculated the non-monetary resources for informal care from family and friends into the total costs.[70,74,78,79,86,136,175,186] Only two studies included the productivity impact.[106,132] The commonly reported health sector cost items were primary care (including professional visits), inpatient and outpatient hospital care, emergency department visits, pharmacy costs and rehabilitation. The commonly reported other sector cost items were residential/nursing home admission, respite care, day-care, domestic and/or personal homecare and Meals on Wheels. We have specified reported differences from these items in *Report Supplementary Material 11*.

The time horizon usually covered the whole trial follow-up period of the study, with length ranging from 6 to 36 months. Results were reported for the whole period except for seven studies, three of them could not follow up all participants for the whole trial follow-up period,[146,147,174] and four reported the intervention phase and the post-intervention phase findings separately.[79,82,106,121]

Evaluation types

The economic evaluation analytic framework of all 39 studies appeared to be trial-based, but this was not explicitly stated in most studies. The evaluation appeared to be planned and embedded within each study, except for one study which described it as post hoc.[99]

All 39 studies reported cost findings. Most studies estimated the total costs of health and social care, and incorporated the costs of experimental intervention and standard intervention or ac into the total costs. Most of the studies described the origins of the cost item prices, for example the national healthcare mean unit cost for a particular year reported by the government, salaries (time and human resources) or materials used during the intervention delivery. Two studies did not collect cost data from the control arm. For conducting the economic evaluation, they assumed that the only difference in cost was that of delivering the experimental intervention.[80,99]

Thirteen studies[73,75,86,99,110,133,136,146,147,161,165,174,182] conducted cost-effectiveness analysis using health outcomes, for example life years saved, Modified Katz ADL Index. Four of them estimated cost-effectiveness with health outcomes which are not of interest in this review, namely Falls Efficacy Scale-International (FES-I),[86] transition out of frailty,[75] quality of care[110] and Canadian Occupational Performance Measure (COPM) performance scale and satisfaction scale.[174] Fourteen studies[70,74,75,79,80,86,112,121,127,136,161,165,175,190] conducted cost-utility analysis using quality-adjusted life-years (QALYs) calculated from the EuroQol Five Dimensions questionnaire (EQ-5D), 12-item Short Form health survey (SF-12), 36-item Short-Form health survey (SF-36) or 15-dimensional measure of health-related quality of life (15D). Twelve studies[74,75,99,110,112,133,146,147,174,175,182,190] estimated the cost-benefits, mostly by estimating the probability of willingness to pay a certain amount of additional cost for the health effects. Twenty-three studies[70,73–75,82,86,99,110,112,121,127,133,136,146,147,161,163,165,174,175,182,186,190] conducted sensitivity analysis to estimate the uncertainty. These sensitivity analyses included cost-effectiveness plane, cost-effectiveness acceptability curve, alternative values of resources and subgroup analysis.

Economic evaluation results and study conclusion

Based on the conclusion of the 39 studies, we identified the experimental interventions which were clearly concluded as a more cost-effective, lower-cost alternative or recommended by the study authors; were explicitly not recommended; and those that no definite conclusion was reached. The conclusions drawn from full economic evaluations in 22 studies are reported separately from the 17 studies that only conducted cost analysis. In most cases, the conclusions regarding an intervention group for a particular time horizon were only drawn from one study. Therefore, we have only stated when there is more than one relevant study.

Cost-effectiveness findings from full economic evaluations

Short-term time horizon

For the short-term time horizon, the authors of four studies[79,80,133,174] concluded that three groups of interventions were more cost-effective in comparison with standard intervention or ac. These intervention groups were evaluated in two similar studies which evaluated meaningful-activities and education versus ac, one adopted a societal perspective[79] and the other adopted a health and social care system perspective;[80] one study evaluated multifactorial-action and review with medication-review versus ac;[133] and one study evaluated homecare, multifactorial-action and review with medication-review and self-management versus homecare, multifactorial-action and review.[174] The latter two studies adopted a health and social care system perspective.[133,174]

Two intervention groups were not considered cost-effective by the studies that evaluated them[161,175] due to a lack of evidence of clinical effectiveness, in comparison with standard interventions, in the short-term time horizon. Stewart 2005[161] evaluated multifactorial-action delivered by an occupational therapist (experimental arm) versus delivery by a social worker (control arm), from a health and social care system perspective. van der Pols-Vijbrief 2017[175] evaluated homecare, nutrition, multifactorial-action and review versus homecare, from the societal perspective.

No definite conclusion was drawn for multifactorial-action and review with self-management versus ac for the short-term time horizon. One study[190] adopted a health and social care system perspective

and concluded that this intervention was not dominant and the probability of cost-effectiveness was conditional on the amount a commissioner was willing to pay.[190]

Medium-term time horizon

For the medium-term time horizon, two studies[79,86] concluded that their experimental intervention was likely to be cost-effective in comparison with ac. The intervention groups were ADL;[86] meaningful-activities and education.[79] Both studies evaluated from a societal perspective.

Three studies concluded that multifactorial-action and review with medication-review in comparison to ac was probably not cost-effective in the medium-term time horizon, mainly based on the high costs or low probability of the intervention being cost-effective at acceptable cost thresholds.[74,110,165] Two studies adopted a healthcare services perspective[110,165] and one study adopted a societal perspective.[74] Additionally, one study[75] estimated, from a health and social care system perspective, that the probability of saving based on QALY was low for the overall group, frail and very frail subgroups of participants; although between the two subgroups, the probability was approximately twice higher in the very frail subgroup (17.8%) than the frail subgroup (8.2%).

Five studies[70,99,121,146,147] reported uncertainty regarding the cost-effectiveness of their experimental intervention in comparison to standard intervention or ac for the medium-term time horizon. They concluded that cost-effectiveness was dependent on the effects and perspectives that were valued. The intervention groups were: ADL, aids and exercise;[99] ADL, nutrition and exercise;[121] multifactorial-action with medication-review and self-management,[70] each compared with ac; and homecare, ADL, multifactorial-action and review with self-management;[146] and homecare, multifactorial-action and review,[147] each compared with homecare and multifactorial-action. The evaluation of the first intervention adopted a healthcare services perspective; the others adopted a societal perspective.

Long-term time horizon

One study concluded that exercise and multifactorial-action with medication-review dominated ac (i.e. representing additional effects with lower costs) in a long-term time horizon, from the health and social care system perspective.[127]

Three studies[73,112,136] concluded that their experimental intervention had a low chance of being cost-effective in comparison to ac, mainly based on a lack of treatment effects. These intervention groups were education, multifactorial-action and review with medication-review and self-management;[136] multifactorial-action and review with medication-review;[73] and welfare-advice.[112] The first intervention was evaluated from a societal perspective,[136] the other two were evaluated from a health and social care system perspective.[73,112]

Two studies[121,182] were uncertain about the cost-effectiveness of their experimental intervention for the long-term time horizon in comparison to a standard intervention or ac, because these interventions were more costly and thus the willingness to pay depended on the decision-makers' valuation of the health effects. The intervention groups were: ADL, nutrition and exercise versus ac;[121] and multifactorial-action and review with medication-review versus multifactorial-action and review.[182] Both were evaluated from a health and social care system perspective.

Consistent and inconsistent findings between studies

Two intervention groups, except standard intervention or ac, were investigated by full economic evaluation in more than one study. We found that each of these groups was only compared as experimental intervention with ac. Meaningful-activities and education was consistently concluded to be more cost-effective than ac in the short- and medium-term time horizons in two studies.[79,80]

Multifactorial-action and review with medication-review was evaluated in comparison to ac in five studies across all the three time horizons. It was only concluded to be more cost-effective in the short

term,[133] but unlikely cost-effective in the medium term[74,110,165] and long term.[73] The long-term cost-effectiveness of this intervention was uncertain in comparison with multifactorial-action and review.[182]

Cost-analysis findings

Short-term time horizon

For the short-term time horizon, two studies[78,132] recommended their experimental intervention based on the small cost difference between arms and the potential benefits from the interventions. One study evaluated multifactorial-action and review with medication-review versus multifactorial-action and review;[78] one study evaluated homecare, multifactorial-action and review with medication-review and self-management versus homecare, multifactorial-action and review.[132] Both were evaluated from a societal perspective.

One study[186] evaluated the comparative costs of multifactorial-action and review with self-management versus ac, for the short-term time horizon from the two perspectives separately. The authors concluded that whether the intervention was cost-saving depended on who commissioned the services.[186]

Medium-term time horizon

Four studies[68,69,124,131] concluded that, on average, the medium-term care costs were lower and the potential health effects, for example better preservations of daily function, were likely better in participants who received the experimental interventions compared with those who received ac or homecare only. The two intervention groups compared with ac were risk-screening;[69] and education, exercise, multifactorial-action and review with medication-review and self-management.[124] The two intervention groups compared with homecare were homecare and aids;[131] and homecare, multifactorial-action and review with medication-review.[68] All were evaluated from a health and social care system perspective.

Two studies[106,150] concluded that their respective experimental interventions did not improve costs of services or health outcomes for the medium-term time horizon. The two intervention groups evaluated were education, multifactorial-action and review with medication-review;[150] and multifactorial-action,[106] each in comparison to ac. The former was evaluated from a health and social care system perspective;[150] the latter was evaluated from a societal perspective.[106]

Two studies[82,143] concluded that their experimental interventions were cost neutral from the health and social care system perspective for the medium-term time horizon. The intervention groups were education, multifactorial-action and review with medication-review;[143] and education, multifactorial-action and review with medication-review and self-management,[82] each in comparison to ac.

Long-term time horizon

One study concluded that homecare, education, multifactorial-action and review compared with homecare could result in very substantial savings in the long-term time horizon.[125] This conclusion was based on the lower total costs among the participants who received the experimental intervention, evaluated from a health and social care system perspective.

Two studies[106,181] concluded that their experimental interventions provided no demonstrable benefits in terms of costs or health status, in the long-term time horizon. The intervention groups were multifactorial-action;[106] and multifactorial-action and review,[181] each in comparison to ac. The former was evaluated from a societal perspective,[106] the latter was evaluated from a health and social care system perspective.[181]

Three groups of experimental interventions were compared with a standard intervention or ac with a health and social care system perspective in five studies,[81,82,118,120,163] of which the study authors concluded that the care costs or care demand were not constant over the long-term time horizon. They

suggested that the experimental intervention arms were more costly during the intervention phase or to the sector paying for the interventions, but total costs appeared lower at a later time or to other sectors. Therefore, at best, the total costs over the long-term time horizon for participants receiving any of the interventions or ac are similar. The intervention groups were: education, multifactorial-action and review with medication-review and self-management compared to ac in two studies;[81,82] multifactorial-action and review with medication-review compared to either ac[163] or multifactorial-action and review;[118] and an alternative version of multifactorial-action and review;[120] compared with a standard intervention in the same group.

Discussion and conclusion about the economic evidence

The economic evaluations of the included studies were not critically appraised. Therefore, we have not attempted to compare the methods or findings of these studies directly. Instead, this commentary indicates the available economic information and evidence that may be relevant to the readers and decision-makers in considering whether to implement any of the interventions evaluated in these studies.

We found a wide variation in cost items and perspectives used in the evaluations, reflecting the variations in content in standard interventions and ac for older people between countries. For example, services that are freely available to older people in need and paid for by the health system in one country may require out-of-pocket payments by older people in another country. This potentially influences the care services which the older people may actively acquire and use.

We found only one study that explored the effect of frailty on cost-effectiveness, which was a trial of exercise, multifactorial-action and review with medication-review and self-management.[75] It subgrouped the participants as either frail or very frail and estimated that the probability of cost-effectiveness based on QALY was low in the very frail subgroup and even lower in the frail subgroup.

From the evidence collected from the 22 full economic evaluations, 5 intervention groups appeared promising compared with a standard intervention or ac from an economic perspective. They are ADL (medium-term time horizon), meaningful-activities and education (short- and medium-term time horizon), homecare, multifactorial-action and review with medication-review and self-management (short-term time horizon), multifactorial-action and review with medication-review (short- but not medium- or long-term time horizon), and exercise and multifactorial-action with medication-review (long-term time horizon).

Limitations

We only drew on the verbatim conclusion from each study to summarise the results. The context, such as settings, hypothesised health benefits and assumptions, economic evaluation aims, methods and time horizons, varied between the studies. All included evaluations appeared trial-based and the time horizon was limited to the trial period, making it difficult to infer the cost-effectiveness and costs beyond the measured period without further analyses. The outcomes and their relevance can be influenced by and sensitive to the choices of cost items, whose costs, whose and what values (e.g. quality of life, remaining in community) to focus on and measure.

Some studies showed low intervention cost and reasonable probability of cost-effectiveness, and yet did not recommend the experimental intervention due to the low certainty in health effect gain.[110,112] On the contrary, a study found higher intervention cost and lower probability of cost-effectiveness but suggested that the experimental intervention was worth implementing.[133] Even though some studies suggested benefits and recommended implementation of the intervention, there may be uncertainties and limited evidence in their findings. We considered that each study justified the conclusion according to how the findings best suited the research context, aim and perspectives, which the study had set to

investigate and address. Moreover, most intervention groups were only evaluated in a singular study each; and the analytic methodology, such as analysis techniques, varied between the studies. Hence, the variations in all these aspects make direct comparisons between the studies difficult.

Sixteen studies only analysed the costs. Nonetheless, they provided details about the resources required for the experimental intervention, which is useful information for decisions about implementing the interventions. Readers and decision-makers should consider the health and other relevant outcomes reported from the respective randomised controlled trials, especially for the interventions which were only evaluated by cost analysis.

Readers of this review will need to assess the extent to which methods and findings of these identified economic evaluations may apply to their setting; and decide whether economics or merely affordability is the main interest for judgement. The studies used mainly actual costs and evaluated for each treatment arm separately. Therefore, if the evaluation context is applicable, the costs and cost-effectiveness results reported in these studies can be reasonable estimates for real-life settings.

Chapter 6 Discussion

Summary of main results

We have grouped community-based complex interventions to sustain independence in older people and synthesised evidence about their effectiveness but remain uncertain about the optimal configuration of such services or whether their effectiveness is related to the frailty of the population. We included evidence from 129 studies with 74,946 participants allocated in 266 intervention arms, which we placed into 63 intervention groups. We found evidence that multifactorial-action and review with medication-review probably improves some important outcomes slightly, but there was also contradictory evidence in the long term. For some other intervention groups there was low-certainty evidence that they may improve or worsen particular outcomes but for most intervention groups evidence was either absent or very uncertain.

For our main clinical outcomes for interventions compared with ac, there were two findings of moderate certainty of some improvement and one of some worsening. There were 16 low-certainty findings of some improvement, 14 of some worsening and 2 of little to no difference. Comparisons with ac can be conceptualised as the effect of addition of an intervention for a general population of older people, not all of whom were in receipt of any particular form of care, referred for a particular service (e.g. homecare, occupational therapy) nor in receipt of regular check-ups. Among comparisons with homecare, there were only six findings of low certainty, two of some benefit, three of some harm and one of little to no difference. Comparisons with homecare can be conceptualised as the effect of an intervention for a population already in receipt of, or newly referred for, homecare, but where that homecare is not allied with rehabilitation (e.g. reablement) or broader care planning. Although these findings were mostly uncertain and often related to small or very small differences, they did not mostly indicate one direction of effect. Therefore, it does not appear that all community-based complex interventions are necessarily beneficial, and some may worsen these outcomes.

There are several plausible interpretations of the mixed findings, including that for many of these services there is no real effect, that some services do more harm than good or that changes that appear to indicate harm are appropriate outcomes in certain circumstances. The uncertainty in these estimates was primarily driven by CIs that included benefit and harm. It may be that these often-small estimates represent the play of chance around no effect, which appear because so many estimates of effect are being produced. However, it could be that the CIs would narrow around similar point estimates if more data were available. Therefore, it may be that some services produce negative outcomes, despite the best intentions of all involved. Although this was not a finding we anticipated, it is not one that should be dismissed entirely. Plausible mechanisms are dependent on the details of the intervention group but include invoking disengagement with the person's health or with services, encouraging an individual to take on more than they are capable of or have the resources to effectively manage, or inducing dependency through risk aversion. It can also be the case that certain events, for example care-home placement or hospitalisation, may represent part of the best care strategy for an individual. Even deterioration in ADL may be in response to provision of assistance for tasks that someone finds difficult or painful and otherwise unrewarding and therefore an acceptable trade-off.

The moderate-certainty evidence all related to multifactorial-action and review with medication-review in comparison with ac, finding a probable slight increase in living at home in the medium term and very slight increase in independence in IADL in the medium term, but in contrast also a very slight reduction in IADL in the long term. The finding of probable harm was driven by the results of Rubenstein 2007,[154] which also contributed to the beneficial medium-term finding. Low-certainty findings for this intervention group included a slight increase in living at home in the long term, as well as little to no difference in short-term living at home or long-term personal ADL. We also found economic evidence

that it can be cost-effective in the short term due to improvements in self-reported mental health, PADL and IADL but also that it was unlikely to be cost-effective in the medium or long term. Clinical findings from other intervention groups that also included multifactorial-action with medication-review (but not self-management) were generally positive.

Among the mixed and uncertain findings, there were some regularities worth noting. The two intervention groups including both nutrition and exercise (ADL, nutrition and exercise; cognitive training, medication-review, nutrition and exercise) were associated with low-certainty findings of increased chance of living at home, and no negative findings. In both these groups the interventions were provided to pre-frail and frail populations following screening. However, the evidence for medium- and long-term cost-effectiveness of ADL, nutrition and exercise was uncertain. Intervention groups including multifactorial-action and review with both medication-review and self-management were generally associated with low certainty findings of worse independence (living at home and ADLs). However, the available economic evidence suggests homecare, multifactorial-action and review with medication-review and self-management may be cost-effective in the short term. It is important to recognise that these are post-analysis observations and therefore apparent patterns may be misleading.

In addition to the findings mentioned above, the summary of economic evidence identified promising intervention groups as ADL (medium term); meaningful-activities and education (short and medium term); and exercise and multifactorial-action with medication-review (long term) based on full economic evaluations.

Our investigations of the impact of frailty and pre-frailty on intervention effects were hampered by a lack of comparisons that contained different frailty populations meaning we were often unable to explore differences. Where we were able to conduct analyses, the results were very uncertain.

Overall completeness and applicability of the evidence

We identified 129 eligible studies despite limiting our criteria to interventions with an explicit focus on independence in ADL, being initiated in the community and excluding falls-specific interventions. Through our intervention categorisation approach, we identified 19 broad components of care and 63 intervention groups among the 266 included interventions. Therefore, a very broad range of interventions have been trialled, but at the same time there are many more possible combinations yet to be trialled. Of those interventions that were trialled, many were not includable in each of our analyses because they had not measured our outcomes of interest or had not reported the results in a way we could include them. For those that we were able to include, we often found the evidence to be of very low certainty, primarily due to insufficient sample sizes that led to wide CIs, and RoB (see *Certainty of the evidence* below).

The trials were typically pragmatic trials and therefore the results are likely to be applicable to similar contexts. However, given the complexity of the interventions and their interaction with context, it is unclear how broadly applicable the results are to different times and places. The participant groups were often targeted, and this should also be taken into consideration when considering applicability to a general population of community-dwelling older people. However, the frailty meta regressions did not identify significant differences in effect for different populations, although these were typically of low power. Exclusions may have limited the possibility for improvement through ceiling effects. However, only 3 of the 108 populations classified for frailty were robust and a further 13 populations did not include the frail group, meaning 92 populations included people living with frailty. Our approach to intervention grouping also separated out the effect of interventions delivered in conjunction with homecare to participants who already qualified for this support, therefore providing evidence of direct relevance to this particularly vulnerable community.

Equality, diversity and inclusion

The core of this review addresses the equality of providing appropriate services to older people. In focusing on maintaining or improving independence, many of the services are designed for people with disabilities. This review's evidence originated from a diverse population of older people, mainly from the more developed countries, territories and regions. Population subgroups of various socioeconomic status, frailty levels and ethnicity were included, and the sex ratio seems to reflect that of this age group. Our inclusion criteria did not restrict any of these characteristics; hence our results included studies conducted with a diverse range of population subgroups, for example interventions targeting specific frailty level or all frailty levels, general older population in a community or those classified into lower socioeconomic status.

The included studies were mostly conducted in developed countries; two developing countries are also included, namely China[114] and Thailand.[115] Some studies specifically targeted people who were socioeconomically deprived,[64,67,82,94,112,134,158,166,167] ethnic minorities or immigrants in the country.[63,67,80,94,122,129]

Forty-four studies reported the participant's ethnicity; three studies only reported participant's country of origin; one study explicitly restricted eligibility to the local majority ethnic group.[93] Twenty-one studies explicitly restricted the eligibility criteria to only include older people or their caregivers who were able to speak the local languages, and thus may not approach or include people who were not native. White, black, Hispanic, Latino, Māori, Indian, Pacific Islander, Filipino and American Asian were the reported included ethnic groups, and we can infer that Japanese, Chinese and Thai were also included. Most of the studies were conducted in Europe and North America and predominantly included white people; hence white participants are the majority in this review. Studies attempted to address the socioeconomic status of the older people in terms of income, property ownership, education level, last occupation or deprivation index based on home address. However, the methods vary; none of these alone or combined is sufficient to reflect the resources and support available and accessible to the older people who have retired or reduced working hours. A minority of study authors commented on the ethnic groups and socioeconomic subgroups proportions if the study particularly targeted some of these groups, for example lower-income older people; or the authors suggested the limitations in representativeness of the included ethnic groups and generalisability of the study results. Some authors commented that their study population was not as deprived as their respective target population, even though the eligibility criteria and recruitment strategies were intended to achieve this.[64,112,134,186] This suggests that some population groups may be more hesitant in participating in research studies or have difficulties in accessing care. Thoughtful strategies are essential in reaching them and ensuring care accessibility for all with need.

In the majority of studies over 50% of participants were women, while in four US studies in the Department of Veterans Affairs healthcare system, veterans were predominantly men (0.6–3.2% women).[88,139,140,155] The sex ratio among the included studies was approximately 64 men per 100 women, which is similar to recent ratios of over-65-year-olds in the more developed regions in the world (60–74 men per 100 women)[596] but lower than the UK's 2019 ratio (84 men per 100 women).[597] Nevertheless, there may be contextual differences in the willingness to participate in research and seek interventions between men and women.

In common with much historical research, gender and sexuality issues have not been examined here. We do not know if these studies are representative of, or applicable to, the lesbian, gay, bisexual, transgender and queer or questioning (LGBTQ) community.

Participants of all levels of frailty were included. Only a minority of studies targeted older people with no restriction on health condition, for example Howel 2019[112] or Vass 2005.[182] Half of the included studies (65 studies) explicitly excluded older people who had cognitive impairment (based on self-report or

cognitive screening test) at baseline, which may limit the generalisability of the results to this subgroup of older people. Another common exclusion health reason was terminal illnesses, which is less relevant to this review's interest. Most of the studies employed secondary (e.g. screening, preventative home visits) or tertiary [e.g. functional task exercise (FTE)] prevention strategies, which targeted older people with symptoms or health conditions. However, even among studies with the oldest populations, people of all frailty levels (robust, pre-frail and frail) were included and the experimental interventions contained health promotion components such as health education,[102] nutritional advice and physical exercise.[96]

Some interventions were targeted at older people living alone, including provision of community-nurse-based comprehensive assessment and case management (multifactorial-action and review)[108] or smart-home aids and adaptations.[172] By contrast, one study investigated integrated nursing care for people living in apartment-sharing communities.[169] Living status can reflect some of the support available to an older person. Some studies required a consented informal caregiver to participate with the older person, thus people who could not identify such a caregiver would have been excluded.

Readers should be aware that the overall diversity included in this review is founded on various narrower subgroups from the individual studies, and therefore the evidence for most intervention groups is based on less diverse population subgroups. When considering the transferability of the review's findings, readers should specify the target population and their needs, and consider how appropriate the evidence base is for a particular intervention group. The participant characteristics included in this review or in the individual studies may guide the readers and decision-makers, yet cannot clearly predict success or failure. For instance, an intervention already trialled with the local ethnic majorities[102] was modified and adapted to suit lower-income ethnic minority migrants to the country, including arrangement of translators and consideration of cultural acceptability in the implementation and delivery.[67] Although the original trial reported postponed decline in health outcomes including self-rated health, the trial of the adapted intervention found no such differences; the authors acknowledged that people with poor language skills and lower education levels were likely to drop out or not be recruited. Hence differences in treatment effects of the same intervention between ethnic groups may be partly explained by the intervention implementation, delivery and uptake. The society's socioeconomic (e.g. health and social care system, who pays for care), cultural (e.g. lifestyle preference and habits) and environmental conditions (e.g. infrastructure of health and social care, accessible care for all) may be more influential than an individual's personal characteristics (e.g. age, sex, ethnicity) in the generalisability of interventions involving changes in lifestyle and care provision.[598,599]

Certainty of the evidence

Many of the trials appeared to be well conducted under challenging circumstances. Few results were downgraded for high RoB related to randomisation, deviations from the intended interventions, outcome measurement or selection of the reported result. We usually had some concerns (but not serious concerns) about possible deviations from the intended interventions as it was unclear if the trial context may have contributed to changes in 'usual care', with participants in the control group seeking alternative interventions as a result of their enrolment and allocation. We typically had some concerns about outcome measurement where our outcome of interest was self-reported: ADLs, self-reported health, depression and loneliness. In most studies participants were likely to be aware of their assignment and we judged there was some risk that their reporting was influenced by this knowledge, but we did not consider the risk to be high. We also typically had some concerns about selection of the reported result as there was no detailed and pre-specified statistical analysis plan available, nor a statement about blinded analysis.

Most results were downgraded due to serious concerns about RoB arising from missing outcome data. This was often inevitable given the combination of a frail population, long timelines, self-reported outcomes and community-based research. It is important to note that many of the risks of within-study

bias were not necessarily the risk of finding a false positive but also bias towards no effect or favouring the control group. Therefore, there is a real risk that intervention effects are under-identified here.

No results were downgraded for indirectness. We made a careful selection of appropriate measures for each outcome and limited results to three time frames. Our study inclusion criteria also led to a selection of relatively pragmatic community-based interventions. However, it is difficult to define one precise population and context to which the interventions are intended to apply. We also identified no strong evidence of differences in effect among them. Because most comparisons were populated by only one trial it is unclear if the evidence is applicable to different contexts. If someone was considering implementing one of these interventions, we recommend examining the contexts and populations of the trials in which it was analysed to consider how applicable the evidence may be for a given scenario.

Only two comparisons with ac were not rated down for imprecision: multifactorial-action and review with medication-review for medium-term IADL independence and risk-screening for long-term care-home placement. Most results were downgraded twice for imprecision, usually because their CIs included substantial benefit and substantial harm. This was partly a product of our interest in effects that we labelled 'very small' but still considered important. Therefore, an alternative formulation of the review that considered only larger effects to be important may have found greater certainty in more results and that they equated to little or no difference in effect. We believe it was appropriate to seek to identify the relatively small effects that we have, given the importance of these outcomes.

Few results were downgraded for heterogeneity (inconsistency), but this is not because there was uniformity among the studies. There were relatively few studies where pairwise comparisons contained more than one intervention and therefore heterogeneity did not substantially affect most estimates. However, it may be that with the inclusion of more studies we would identify statistical heterogeneity that was not apparent in these analyses.

No results were downgraded for inconsistency (incoherence). It was rare that we were able to assess the difference in direct and indirect estimates as there were few closed loops in our networks. Where we were able to examine this, our assessments were inevitably low powered. Nonetheless the available data and global statistics did not tend to indicate a problem with inconsistency where it could be examined. In one case, we would have considered rating down for inconsistency, but the evidence was already judged very low certainty (multifactorial-action vs. ac for medium-term mortality).

We found no evidence of non-reporting bias (publication bias/small-study effects) through examination of funnel plots although again, it was rare that we were able to investigate this. Some studies did not report usable results for our outcomes of interest, even though it appeared they had measured the outcome, but it was not clear that this was driven by the results as very few of any results reported were statistically significant.

We did not GRADE the ranking of interventions, but CIs were usually wide. Additionally, because the estimates for many interventions were of very low certainty, the meaning of particular rankings was unclear. Therefore, we have placed little emphasis on rankings in our interpretation.

Potential limitations in the review process

The search was complex due to the broad nature of the interventions we were including, which were not limited to an explicit list of intervention types. We built an extensive search strategy and compared results with lists of studies from previous similar systematic reviews; we also included citation searching in our strategy. In screening 40,112 references we cast our net wide to give us the best chance of identifying all relevant studies but, given the lack of specificity, it is likely that some includable studies remained unidentified.

One of the criteria for inclusion was that the intervention aimed to sustain independence in ADL. Aims of interventions (rather than studies) were often not explicitly stated. We included studies where independence in ADL was stated as an aim of the intervention or was measured. We were aware that some interventions that appeared similar in terms of process were excluded, and it is possible that there was selection bias related to non-reporting bias – studies that had measured independence in ADL but failed to report this were excluded – which in turn would be likely to relate to the effects measured. Given that very few studies reported statistically significant findings for ADL it seems unlikely that this was a substantial problem.

We attempted to obtain additional information from many study authors and these attempts were often successful, however, we were not able to be certain of the exclusion of five studies for which we had insufficient information to make a decision.

For sixteen studies, although we had sufficient details to include them in this review, we had no results reports for our outcomes of interest. We contacted the study authors and searched for the reports at least twice.

We developed our grouping of interventions using a data-driven approach with expert guidance. We did so without consideration of the effects reported by studies nor with a particular intervention we were seeking to highlight. However, we acknowledge other syntheses may identify alternative groupings. Indeed, it is easy to imagine many dimensions by which the interventions could be grouped, and these were coded and summarised as part of our work. However, we think some broad considerations of the procedures are likely to be a basic constituent of most classifications of interventions in effectiveness reviews (e.g. Tricco *et al.*[25]). It should also be noted that dividing interventions on other dimensions may have been challenging in practice as other aspects of interest were often not reported consistently, or, in the case of dose/intensity, would be difficult to divide cleanly across such diverse interventions.

Our findings provide an evidence-based and more sophisticated alternative to the ad hoc classification of community-based complex interventions for older people published by Beswick *et al.*, where five intervention groups were defined (geriatric assessment of older people; geriatric assessment of older people assessed as frail; community-based care after hospital discharge; fall prevention; counselling; and group education and counselling).[8] When we first designed this review, we planned for an expert reference panel to suggest the groupings. However, we revised our plans to conduct the intervention grouping within the research team as we considered there was insufficient tacit expertise on how it is most appropriate to group these interventions for NMA and the volume of data that was produced by our analysis would have been inappropriate for consideration by an expert panel. Having developed groupings, we then sought to refine these based on feedback in open discussions with experts to ensure their clarity and suitability.

The way we grouped interventions, combined with the lack of studies that contributed to most analyses, resulted in sparse networks. In developing the groups, we focused on identifying clinically useful distinctions rather than groups that pooled some number of interventions. We tried to keep components broad but meaningful (e.g. grouping aerobic and resistance exercises but separating these from ADL training). Key to our approach was the principle that the identified components should be intended for all participants. Therefore, differences in groups reflected substantial differences between the interventions (e.g. whether or not everyone was supposed to receive health education). We did not intend or realise how sparse the networks would be until the analyses were conducted. It would have been possible to take steps to regroup the interventions to pool more data. For example, we could have ignored the features of multifactorial-action (self-management strategies and medication-review) by which we further divided that component. We also considered uniting the ac and homecare networks by either ignoring the homecare component in all groups or just grouping homecare with ac. We decided to analyse the interventions consistent with our original groupings given the diversity of multifactorial-action and the potential importance of homecare as a cointervention and delivery

mechanism. We also hoped this would produce separate evidence of greater relevance to the social care sector. More radically collapsing the groups, for example to single-domain, multidomain, multifactorial, and multifactorial and multidomain interventions would have produced an analysis with more pooling of evidence, which might have narrowed CIs, but may also have introduced substantial statistical heterogeneity and very abstract groups. By dividing the interventions as we did it is possible that we lost power but gained resolution, which may ultimately be more useful for practical decision-making.

We set out our approach to NMA unaware of how sparse our networks would be. We could have explored a variety of approaches to estimating the effects, which may have given us greater certainty in some of our estimates.[600] Due to the sparsity of both direct and indirect evidence, there was low power to examine heterogeneity and inconsistency in most of the networks.

We were unable to effectively investigate the impact of population frailty on intervention effects. Many intervention groups were unable to be assessed due to collinearity, and all frailty analyses had low power due to the small number of studies included in these analyses. Because we identified homecare as a cointervention for both arms of many studies, we divided our network in two in a way that was highly correlated with frailty, with most homecare populations being frail. This further limited our ability to investigate the effect of frailty.

Although we initially planned to use GRADE to assess certainty, we decided to use CINeMA to make our assessments more systematic and reproducible. However, once we had performed our analyses, we discovered that the CINeMA software could not estimate imprecision, heterogeneity or incoherence for many of our networks. We therefore decided to return to our original plan of using GRADE. Had we used fallback rules for these networks suggested by the authors of CINeMA we would have rated all of the evidence from estimates with no concerns about RoB, indirectness, publication bias or imprecision as very low confidence due to major concerns with heterogeneity and incoherence as they could not be evaluated. By contrast, where we could have implemented CINeMA as intended, we would have rated the evidence for some estimates as high or moderate certainty without manual adjustment that we have rated low or very low certainty using GRADE because the estimates were based on very small amounts of information.

Our summary of economic evidence drew on the verbatim conclusions of the included studies rather than reanalysing their results, therefore it is difficult to examine the comparative strengths of the findings. We did not conduct an additional search for economic evaluations set outside of a trial context. Therefore, further cost-effectiveness information may be available to inform decisions.

Patient and public involvement

This review benefited from the involvement of our established PPI FOG in the Bradford Institute for Health Research. The FOG has a structure that provides connections to the whole spectrum of older people, with a focus on those living with frailty to enable meaningful, public involvement in our research projects. We consulted our FOG throughout the development of the protocol and discussed plans in detail at the group's quarterly meetings and at our annual consumer research conference. Particular examples of PPI contribution include the selection of important outcomes and their prioritisation as main and additional outcomes. FOG members emphasised a wide range of outcomes were important to older people, with a particular focus on independence in addition to well-being, alongside service-orientated outcomes. We also spent time discussing the intervention components we had identified with FOG members. Through this work we developed and refined our plain language descriptions, public-facing names, and domains in which to organise and explain the components and thus the findings. FOG members also helped draft and revise the plain language summary for our original application and this final report, ensuring this work was clearly and carefully explained. Because this was secondary research there were no participant materials to review, nor current ethical implications to consider.

Agreements and disagreements with other studies or reviews

The systematic review by Beswick *et al.*[8] identified consistent estimates in favour of community-based complex interventions for living at home, nursing home and hospital admissions and physical function, with little difference between types of intervention, having grouped them as geriatric assessment, community-based care after hospital discharge, fall prevention (excluded from this review) or group education and counselling. By contrast we found almost equivocal evidence of possible benefit and harm from such interventions albeit grouped in a more detailed way. For most estimates in the review of Beswick *et al.* there was moderate statistical heterogeneity (e.g. I^2 = 35% for not living at home for geriatric assessment of general elderly people) suggesting there may have been underlying differences in the effects of pooled interventions.[8] Additionally, that review included many studies excluded from this review, often because they were not clearly aimed at sustaining independence, were initiated in hospital or delivered in an outpatient setting, and therefore the evidence base is different. We also declined to pool as many different measures together, for example limiting to measures of instrumental and personal ADL instead of all measures of physical function.

Whitehead *et al*. examined the effect of interventions to reduce dependence in personal ADL of homecare users.[601] This is similar to our analyses of interventions compared with homecare as the reference comparator. In addition to RCTs they included non-randomised controlled trials and controlled before-and-after studies. They identified a broad variety of intervention content and concluded there was limited evidence that such interventions reduced dependence in homecare users. We also identified low-certainty evidence of a very slight increase in short-term PADL in the comparison of homecare, ADL, multifactorial-action and review with self-management versus homecare, which drew on a study included in their review. We also found low-certainty evidence of an increase in medium-term PADL due to homecare, multifactorial-action and review with medication-review, which drew on a different literature to that included in the review of Whitehead *et al.*

Luker *et al*. examined services to avoid residential aged care admission, including 31 RCTs and pooling 11 studies that they grouped as complex interventions.[602] They found a small, statistically significant reduction in risk in a fixed-effect analysis but substantial heterogeneity (I^2 = 78%). They found the reduction was greatest in dementia-specific interventions, which are excluded from this review. In our NMAs there were two statistically significant estimates related to reductions in care-home placement, but we rated them as very low certainty due to their RoB and being based on very few events. We calculated one statistically significant estimate related to increases in care-home placement and rated this evidence as low certainty due to RoB and heterogeneity.

While other reviews of similar literature have identified positive effects, albeit small and with some limitations in the underlying evidence, this review has found apparent evidence of both harm and benefit. While this difference may in part be a product of the different study designs and intervention contexts included in these reviews, it may also relate to the broad pairwise pooling of interventions with different combinations of components, different comparators and heterogeneous effects and time points. These other reviews also did not use GRADE to assess certainty of the evidence or the RoB 2 tool to assess RoB, and may therefore have been less likely to conclude that a statistically significant finding was nonetheless very uncertain.

Recommendations for future research

Despite a huge amount of primary research (129 studies, 74,946 participants) there is low certainty, very low certainty or an absence of evidence for most interventions and comparisons. Although methodological improvements in the primary research could improve some of these findings it is worth considering the scale of effort that would be needed to begin to complete this network of interventions. Therefore, it is unclear whether it would be an effective use of research resources to embark on a

programme of large-scale RCTs to examine these interventions further. Value of information analysis may be a helpful next step.

Where RCTs are conducted, the following learning should be considered. The small scale of effects observed suggests future trials should be much larger than most of those included here to provide sufficient power. Alternatively, trials may better focus on more proximal outcomes if exploring small configurational differences in interventions. Comparisons with alternative interventions would be useful to further populate a future NMA, to reduce concerns that control participants sought alternative interventions, but also to provide evidence in comparison with relatively established intervention groups such as multifactorial-action and review with medication-review. Trials should ensure they explore possible effects of the trial context on participant and provider behaviour through process evaluation and consider whether cluster-randomisation would help to minimise the possibilities of contamination. Many results were at high RoB due to missing data, yet others managed to retain participants by providing support and continuing to collect outcomes following care-home placement. Use of routine data and planning to report living at home explicitly would also be beneficial. Furthermore, it is vital that studies report detailed reasons for losses to follow up per group, not overall, to help identify whether losses were balanced. Establishing consensus outcomes and measures, alongside more complete reporting, may enable greater pooling of data in the future.

More generally for intervention research, there is continued need for a focus on the specification of the intervention. While interventions need not be over-specified it is important that there is explicit clarity about what was intended in both arms as well as what happened and the context. In particular, we would like to see greater reporting of the organisational aspects of interventions and their implementation, such as institutional responsibilities, inter-institutional agreements and relations, intervention-deliverer and implementer roles and responsibilities, co-ordination mechanisms such as explicit co-ordinator roles, team meetings, shared information systems and related workflows and responsibilities. For example, it appeared that in some interventions the person conducting multidomain assessment and care planning may have been taking on a co-ordinating role, liaising with other professionals and yet this was entirely implicit. We added an item about organisation to the TIDieR framework as we found this lacking in the original and recommend consideration is given to adopting this more widely. These are important, potentially influential aspects of context and process that should be considered more carefully in complex intervention research.[603]

Our approach to intervention grouping ensured our NMA was based on substantial differences in active intervention content, looking beyond the label applied by study authors. The components that defined these groups are similar to the 'Descriptor subdomains' in the Prevention of Falls Network Europe (ProFaNE) taxonomy suggesting some applicability beyond the current field.[604] The descriptions of intervention groups in the TIDieR format should be a valuable resource for future intervention development. The components, or our approach to identifying and grouping them, could be adopted by others seeking to conceptualise or synthesise the evidence. It could also be used to consider the components or combinations most in need of evaluation.

We found the RoB 2 tool valuable in differentiating the RoB between outcome results within a study, such as variation in missingness of data between outcomes and time points. On the other hand, this increased the amount of time required to assess the results for each study when compared with our previous experience of using the Cochrane risk-of-bias tool. This review was a very substantial undertaking and thought must be given to reducing the burden of systematic reviews while continuing to strive for excellence.

As described above, we planned to evaluate evidence certainty using GRADE, then informed by CINeMA, and eventually just using GRADE. Through this process we recognised that the differences between CINeMA and GRADE are not just technical but that they are founded on differing principles. Among these, CINeMA typically seeks evidence of the absence of a problem while GRADE does not

assume there are serious problems in the absence of evidence. We suggest that reviewers considering using CINeMA are cautious if their network is likely to be sparse. We also suggest they consider adopting GRADE's recent guidance regarding imprecision to avoid high-certainty ratings for findings based on very little evidence.[50]

Future work with this data set could explore whether homecare as a cointervention substantially interacted with the other intervention components and whether the effects of frailty could be better estimated by cancelling out homecare when it is present on both sides of the comparison.

Future reviews of similar interventions for older people could focus on those where there is a process intended to lead to multifactorial-action, among which almost all direct comparisons were found and which may align better with mainstream community services. It would be useful to explore the effectiveness of such interventions regardless of an explicit focus on sustaining independence, which may relate more closely to reporting than the intervention developer's tacit logic model. With so many participants and such uncertainty in the current review, it may be useful to conduct an individual patient data (IPD) meta-analysis, to better explore the factors that may relate to benefit or harm.

Realist synthesis, to explore the relationships between mechanisms, contexts and outcomes in such a complex field, would provide complementary evidence regarding these interventions, placing an emphasis on questions of for whom and in what circumstances as well as the mechanisms underlying plausible benefit and harm. It seems unlikely that most of these interventions are having no effects on some individuals, and yet they are difficult to identify in these studies. Given the uncertainty that it seems is inherent in the evidence from RCTs in this context, an alternative paradigm that embraces complexity and uncertainty may prove fruitful. This may also inform better targeting of interventions in future evaluations.

Implications for decision-makers

While evidence is far from certain, our best evidence of combinations associated with benefit are service models for older people where there is the potential for multifactorial-action. There is evidence that indicates that medication-review (which usually implies a review of the person's health conditions and hence what the ideal medications for them should be) is an effective aspect of multifactorial-action, and so services that include access to clinical personnel capable of doing this should be favoured.

On the basis of these findings, services should be favoured in which there is ongoing review. This is a challenge to providers who will find it cheaper to provide services by not providing follow-up, and the more follow-up occurs the more the total size of the caseload of a service will be limited. However, failure to review and follow-up may mean that the service overall is ineffective and thus it may be better to treat a smaller number of people effectively than a larger number ineffectively.

The combination of exercise and nutritional support was a part of two favourable intervention groups within the previously mentioned limits of this review. Given the strong evidence base for the benefit of exercise and optimal nutrition to health and healthy ageing, again it seems prudent to include access to these in multifactorial services (and by inference imprudent not to).[605,606]

We found, contrary to prior expectations, that there is an evidence base that some intervention combinations could reduce independence. While this evidence is uncertain, it is nearly as uncertain as the evidence of benefit. This being the case, it seems prudent not to assume that all services are effective and to be aware that some combinations could be harmful.

Finally, reflecting the incompleteness of the results here, we do not wish to imply that the absence of evidence of effectiveness of some interventions and combinations should be taken to imply evidence

of ineffectiveness. Some of the risks we identified were that results downplayed true effects or needed additional research to increase certainty. Thus, although we advise that those intervention aspects outlined here should form part of services for older people, we do not mean to imply that only these components should be offered.

In the absence of stronger evidence from elsewhere, evidence-based commissioners, providers and practitioners should aim to align service provision with these most promising intervention combinations.

Conclusions

The available evidence suggests the community-based complex interventions most likely to sustain independence in older people include multifactorial-action from multidomain assessment and individualised care planning, medication-review and routine review of patients. Specifically, such interventions probably increase the chance of living at home slightly and may also increase IADL independence very slightly. The combination of physical exercise and nutritional support may also increase the chance of living at home. There was some positive evidence for multiple other combinations of intervention components. Some combinations may reduce independence, and this deserves further consideration. Studies were diverse and therefore these findings may not apply to all populations or contexts.

Despite an extensive search and a rigorous appraisal and synthesis process, we were unable to identify which community-based complex interventions were the best because the benefits and risks of most types of interventions were unclear. High RoB due to missing outcome data in most results and imprecise estimates due to wide CIs meant that most evidence was low or very low certainty. Few studies contributed to each comparison, which impeded evaluation of inconsistency and frailty, and meant that evidence was absent for many intervention types.

This project has robustly described and categorised the components of the community-based interventions evaluated, illuminating the complexity of the field, improving the granularity with which effects are estimated and providing a substantial resource to inform future service development. Further research is required to explore the mechanisms of action and interaction with context. Large-scale trials and different methods for evidence synthesis may illuminate further.

Additional information

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Data-sharing statement

All data requests should be submitted to the corresponding author for consideration. Access to available anonymised data may be granted following review.

Ethics statement

Ethics approval was not sought as this systematic review was secondary research using aggregated, anonymised data that is available in the public domain.

Information governance statement

This study did not handle any personal information.

Disclosure of interests

Full disclosure of interests: Completed ICMJE forms for all authors, including all related interests, are available in the toolkit on the NIHR Journals Library report publication page at https://doi.org/10.3310/HNRP2514.

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The protocol has been published as follows:

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Our experience of assessing risk of bias in this review has been published as follows:

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A brief summary of the main findings has been published as follows:

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Appendix 1 Electronic search strategies

Cochrane Central Register of Controlled Trials (CENTRAL) via Wiley interface was searched. The database coverage was 1992–present and the database was searched on 11 August 2021.

#1 ((frail* or prefrailty)):ti,ab,kw (Word variations have been searched) 4037
#2 MeSH descriptor: [Aged] explode all trees 213642
#3 MeSH descriptor: [Geriatrics] this term only 207
#4 (elderly or old* next people* or old* next person* or old* next wom?n* or old* next m?n* or old* next male* or old* next female* or old* next adult* or old* next age* or aging or geriatric* or senior next citizen* or seniors or pensioner* or veteran* or sexagenarian* or septuagenarian* or octogenarian* or nonagenarian* or centenarian*):ti,ab,kw 92534
#5 ((over Near/2 ('60' or '61' or '62' or '63' or '64' or '65' or '66' or '67' or '68' or '69' or '70' or '71' or '72' or '73' or '74' or '75' or '76' or '77' or '78' or '79' or '80' or '81' or '82' or '83' or '84' or '85' or '86' or '87' or '88' or '89' or '90' or '91' or '92' or '93' or '94' or '95' or '96' or '97' or '98' or '99' or '100') Near years)):ti,ab,kw (Word variations have been searched) 3277
#6 {or #1-#5} 283983
#7 MeSH descriptor: [Independent Living] this term only 544
#8 MeSH descriptor: [Community Health Nursing] explode all trees 345
#9 ('Community support services'):ti,ab,kw (Word variations have been searched) 23
#10 MeSH descriptor: [Managed Care Programs] explode all trees 502
#11 ('health maintenance organization*' or 'health maintenance organisation*'):ti,ab,kw (Word variations have been searched) 627
#12 (HMO*):ti,ab,kw (Word variations have been searched) 494
#13 MeSH descriptor: [Social Work] this term only 184
#14 (social Near/3 services):ti,ab,kw (Word variations have been searched) 1417
#15 ('Voluntary services'):ti,ab,kw (Word variations have been searched) 14
#16 MeSH descriptor: [Home Nursing] this term only 282
#17 ('house call*'):ti,ab,kw (Word variations have been searched) 583
#18 (home near/5 visit*):ti,ab,kw (Word variations have been searched) 5140
#19 ((('general practice' or 'primary care' or nurse* or group or 'ambulatory clinic' or 'geriatric clinic') near/3 visit*)):ti,ab,kw (Word variations have been searched) 4731
#20 MeSH descriptor: [Geriatric Assessment] this term only 1509
#21 (pharmac* near/2 visit):ti,ab,kw (Word variations have been searched) 278
#22 ((home or house) near/2 appointment*):ti,ab,kw (Word variations have been searched) 24
#23 ('Home Care Services'):ti,ab,kw (Word variations have been searched) 2257
#24 MeSH descriptor: [Home Care Services] this term only 1883
#25 MeSH descriptor: [Health Services for the Aged] this term only 456
#26 MeSH descriptor: [Home Health Nursing] explode all trees 7
#27 ('district nursing'):ti,ab,kw (Word variations have been searched) 115
#28 ('health visit*'):ti,ab,kw (Word variations have been searched) 186
#29 ('community matron'):ti,ab,kw (Word variations have been searched) 4
#30 (home Near/3 (intervention* or support* or assessment*)):ti,ab,kw (Word variations have been searched) 4926
#31 MeSH descriptor: [Home Health Nursing] this term only 7
#32 (((preventive* or preventative*) near/5 medicine)):ti,ab,kw (Word variations have been searched) 781
#33 MeSH descriptor: [Preventive Medicine] this term only 121
#34 ((preventive* or preventative*) near/3 (program* or intervent* or support* or care or service* or approach* or 'case management' or measure* or OT or 'occupational therapy' or assess*)):ti,ab,kw (Word variations have been searched) 6275

#35 {or #7-#34} 25735
#36 MeSH descriptor: [Geriatric Nursing] this term only 178
#37 ('geriatric nursing'):ti,ab,kw (Word variations have been searched) 274
#38 {or #36-#37} 274
#39 MeSH descriptor: [Community Health Services] this term only 1061
#40 (community):ti,ab,kw 46478
#41 MeSH descriptor: [Community Health Nursing] explode all trees 345
#42 MeSH descriptor: [Community Pharmacy Services] this term only 271
#43 MeSH descriptor: [Home Care Services] this term only 1883
#44 MeSH descriptor: [Aftercare] this term only 661
#45 MeSH descriptor: [Primary Health Care] this term only 4388
#46 (domiciliary or ('social support' and home*) or ((homecare or medical) near/2 home) or (home and package*) or (outreach and home) or '(alternative setting' and home) or 'home visit*' or 'home manag*' or homecare or 'home care' or 'home therap*' or (model* adj1 home*) or 'home program*' or 'home monitor*'):ti,ab,kw (Word variations have been searched) 12652
#47 ('home-based' or homebased or homebound):ti,ab,kw (Word variations have been searched) 7510
#48 ((live or living or lived or dwell*) near/5 ('at home' or 'own home' or 'in home' or alone or independent*)):ti,ab,kw (Word variations have been searched) 3855
#49 ('Home care' or 'primary care' or 'primary healthcare' or 'primary health care' or 'community dwelling'):ti,ab,kw (Word variations have been searched) 31085
#50 {or #39-#49} 80654
#51 #38 AND #50 103
#52 #35 or #51 25779
#53 #6 and #52 8010
#54 (coronary heart disease or CHD or chronic obstructive pulmonary disease or COPD or kidney failure or CKD or Heart failure or diabetes or asthma or cancer or schizophrenia or severe mental illness*):ti 210929
#55 #53 NOT #54 7003

MEDLINE(R) ALL was searched via OvidSP. The database coverage was 1946–present and the database was searched on 9 August 2021.

1 randomized controlled trial.pt. (539556)
2 controlled clinical trial.pt. (94320)
3 randomized.ab. (529280)
4 placebo.ab. (220248)
5 clinical trials as topic.sh. (196870)
6 randomly.ab. (363058)
7 trial.ti. (244962)
8 or/1–7 (1384889)
9 exp animals/not humans.sh. (4870600)
10 8 not 9 [Cochrane Highly Sensitive Search Strategy for identifying randomized trials in MEDLINE: sensitivity- and precision-maximizing version (2008 revision)] (1274483)
11 Clinical Trial, Phase III/(18797)
12 ('phase 3' or 'phase3' or 'phase III' or 'P3' or 'PIII').ti,ab,kw. (73139)
13 11 or 12 [search filter for phase three trials to supplement Cochrane HSSS, Cooper 2019] (79735)
14 10 or 13 [final RCT filter] (1318490)
15 (frail* or prefrailty).tw. (25865)
16 exp aged/(3283911)
17 geriatrics/(30590)
18 (elder* or older or old people* or old person* or old wom#n*1 or old m#n*1 or old male*1 or old female*1 or old adult*1 or old age* or aging or ageing or geriatric* or senior citizen* or seniors or pensioner* or veteran* or sexagenarian* or septuagenarian* or octogenarian* or nonagenarian* or centenarian*).tw,kf. (1385083)

19 (over adj2 ('60' or '61' or '62' or '63' or '64' or '65' or '66' or '67' or '68' or '69' or '70' or '71' or '72' or '73' or '74' or '75' or '76' or '77' or '78' or '79' or '80' or '81' or '82' or '83' or '84' or '85' or '86' or '87' or '88' or '89' or '90' or '91' or '92' or '93' or '94' or '95' or '96' or '97' or '98' or '99' or '100') adj years).tw. (21451)
20 or/15–19 [older or frail people] (4132930)
21 independent living/(8001)
22 community health services/(32391)
23 community health nursing/(19684)
24 Community support services.tw. (173)
25 exp managed care programs/(40081)
26 (health maintenance organi?ation* or HMO*).tw. (13817)
27 (Social adj3 services).tw. (10694)
28 Voluntary services.tw. (99)
29 *home nursing/(5361)
30 House Calls/(3846)
31 house call*.tw. (656)
32 (home adj5 visit*).tw. (12399)
33 ((general practice or primary care or nurse* or group or ambulatory clinic or geriatric clinic) adj3 visit*).tw. (9527)
34 *geriatric assessment/(13906)
35 (pharmac* adj2 visit).tw. (212)
36 ((home or house) adj2 appointment*).tw. (52)
37 Home Care Services/(34738)
38 Home care service*.tw. (1913)
39 *health services for the aged/(14001)
40 home health nursing/(364)
41 district nursing.tw. (667)
42 health visit*.ti. or health visit*.ab./freq = 2 (2285)
43 community matron*.ti. or community matron*.ab./freq = 2 (83)
44 (home adj3 (intervention* or support* or assessment*)).tw. (8887)
45 preventive health services/(14024)
46 ((preventive* or preventative*) adj5 medicine).tw. (7306)
47 preventative medicine/(11938)
48 ((preventive* or preventative*) adj3 (program* or intervent* or support* or care or service* or approach* or case management or measure* or OT or occupational therapy or assess*)).tw. (66507)
49 or/21–48 (283985)
50 geriatric nursing/(13707)
51 geriatric nurs*.tw,kf. (1164)
52 or/50–51 [geriatric nursing] (14118)
53 community.ti,ab,kf. (539116)
54 community health services/or community health nursing/or community mental health services/or community pharmacy services/(74241)
55 'domiciliary care'/(34738)
56 aftercare/(10404)
57 primary health care/(83064)
58 (domiciliary or (social support and home*) or ((homecare or medical) adj2 home) or (home and package*) or (outreach and home) or (alternative setting and home) or home visit* or home manag* or homecare or home care or home therap* or (model* adj1 home*) or home program* or home monitor*).tw. (58982)
59 ((live or living or lived or dwell*) adj5 ('at home' or 'own home' or 'in home' or alone or independent*)).tw. (17479)
60 (home-based or homebased or homebound).tw. (12811)
61 (Home care or primary care or primary health care or primary healthcare).tw. (163820)

62 or/53–61 [interventions in a community or home setting] (808717)
63 52 and 62 [geriatric nursing and interventions in a community or home setting] (2015)
64 49 or 63 [all interventions] (284694)
65 (coronary heart disease or CHD or chronic obstructive pulmonary disease or COPD or kidney failure or CKD or Heart failure or diabetes or asthma or cancer or schizophrenia or severe mental illness*).ti. (1592860)
66 64 not 65 [all interventions excluding specific diseases in title] (267883)
67 14 and 20 and 66 [RCTS and older people and interventions] (7005)

Embase and Embase Classic via OvidSP was searched. The database coverage was 1947–present and the database was searched on 9 August 2021.

1 randomized controlled trial/ (672319)
2 controlled clinical study/ (463974)
3 1 or 2 (860531)
4 random*.tw. (1703521)
5 randomisation/ (91766)
6 intermethod comparison/ (273924)
7 placebo.tw. (332206)
8 (compare or compared or comparison).ti. (574408)
9 ((evaluated or evaluate or evaluating or assessed or assess) and (compare or compared)).ab. (2067060)
10 (open adj label).ti,ab. (89661)
11 ((double or single or doubly or singly) adj blind).tw. (227285)
12 parallel group$1.tw. (27916)
13 double blind procedure/ (188870)
14 (crossover or cross over).tw. (113362)
15 ((assign* or match or matched or allocation) adj5 (alternate or group$1 or intervention$1 or patient$1 or subject$1 or participant$1)).tw. (362240)
16 (assigned or allocated).tw. (427304)
17 (controlled adj7 (study or design or trial)).tw. (388612)
18 (volunteer or volunteers).tw. (265628)
19 human experiment/(551078)
20 trial.ti. (343846)
21 or/4–20 (5189451)
22 21 or 3 (5347546)
23 (random* adj sampl* adj7 ('cross section*' or questionnaire$1 or survey* or database$1)).tw. not (comparative study/or controlled study/or randomi?ed controlled.tw. or randomly assigned.tw.) (8774)
24 Cross-sectional study/not (randomized controlled trial/or controlled clinical study/or controlled study/or randomi?ed controlled.tw. or control group$1.tw.) (277846)
25 (((case adj control*) and random*) not randomi?ed controlled).tw. (18755)
26 (Systematic review not (trial or study)).ti. (182362)
27 (nonrandom* not random*).tw. (17268)
28 'Random field*'.tw. (2544)
29 (random cluster adj3 sampl*).tw. (1374)
30 (review.ab. and review.pt.) not trial.ti. (913087)
31 'we searched'.ab. and (review.ti. or review.pt.) (37761)
32 'update review'.ab. (119)
33 (databases adj4 searched).ab. (44421)
34 (rat or rats or mouse or mice or swine or porcine or murine or sheep or lambs or pigs or piglets or rabbit or rabbits or cat or cats or dog or dogs or cattle or bovine or monkey or monkeys or trout or marmoset$1).ti. and animal experiment/(1116446)

35 Animal experiment/not (human experiment/or human/) (2346095)
36 or/23-35 (3759577)
37 22 not 36 [Cochrane Highly Sensitive Search Strategy for identifying controlled trials in Embase: (2018 revision); Ovid format (Glanville *et al.*, 2019b)] (4755948)
38 (frail* or prefrailty).tw. (39809)
39 aged/(3370037)
40 very elderly/(236950)
41 frail elderly/(10922)
42 geriatrics/(39915)
43 (elder* or older or old pele*ople* or old person* or old wom#n*1 or old m#n*1 or old ma1 or old female*1 or old adult*1 or old age* or aging or ageing or geriatric* or senior citizen* or seniors or pensioner* or veteran* or sexagenarian* or septuagenarian* or octogenarian* or nonagenarian* or centenarian*).tw,kw. (1838159)
44 (over adj2 ('60' or '61' or '62' or '63' or '64' or '65' or '66' or '67' or '68' or '69' or '70' or '71' or '72' or '73' or '74' or '75' or '76' or '77' or '78' or '79' or '80' or '81' or '82' or '83' or '84' or '85' or '86' or '87' or '88' or '89' or '90' or '91' or '92' or '93' or '94' or '95' or '96' or '97' or '98' or '99' or '100') adj years).tw. (33789)
45 or/38–44 [frail or elderly people] (4516350)
46 independent living/(5523)
47 community care/(61677)
48 community health nursing/(26723)
49 Community support services.tw. (239)
50 (health maintenance organi?ation* or HMO*).tw. (16728)
51 (Social adj3 services).tw. (14016)
52 Voluntary services.tw. (148)
53 home visit/(3712)
54 house call*.tw. (852)
55 (home adj5 visit*).tw. (17275)
56 ((general practice or primary care or nurse* or group or ambulatory clinic or geriatric clinic) adj3 visit*).tw. (14158)
57 *geriatric assessment/(6239)
58 (pharmac* adj2 visit).tw. (504)
59 ((home or house) adj2 appointment*).tw. (107)
60 Home Care/(66345)
61 Home care service*.tw. (2345)
62 *elderly care/(21267)
63 district nursing.tw. (664)
64 health visit*.ti. or health visit*.ab./freq = 2 (2402)
65 community matron*.ti. or community matron*.ab./freq = 2 (82)
66 (home adj3 (intervention* or support* or assessment*)).tw. (12351)
67 preventive health service/(30244)
68 ((preventive* or preventative*) adj5 medicine).tw. (12282)
69 preventive medicine/(29022)
70 ((preventive* or preventative*) adj3 (program* or intervent* or support* or care or service* or approach* or case management or measure* or OT or occupational therapy or assess*)).tw. (88643)
71 or/46–70 [specific interventions] (376111)
72 geriatric nursing/(12986)
73 geriatric nurs*.tw,kw. (1405)
74 or/72–73 [geriatric nursing] (13603)
75 community.tw,kw. (686753)
76 community health services/or community health nursing/or mental health service/or 'pharmacy (shop)'/(144914)
77 aftercare/(8598)

78 primary health care/(70765)
79 (domiciliary or (social support and home*) or ((homecare or medical) adj2 home) or (home and package*) or (outreach and home) or (alternative setting and home) or home visit* or home manag* or homecare or home care or home therap* or (model* adj1 home*) or home program* or home monitor*).tw. (78824)
80 ((live or living or lived or dwell*) adj5 ('at home' or 'own home' or 'in home' or alone or independent*)).tw. (24399)
81 (home-based or homebased or homebound).tw. (17773)
82 (Home care or primary care or primary healthcare or primary health care).tw. (217034)
83 or/75–82 [home or community setting] (1060004)
84 74 and 83 [geriatric nursing and home or community setting] (1864)
85 71 or 84 [all interventions] (376832)
86 (coronary heart disease or CHD or chronic obstructive pulmonary disease or COPD or kidney failure or CKD or Heart failure or diabetes or asthma or cancer or schizophrenia or severe mental illness*).ti. (2270105)
87 85 not 86 [all interventions except those mentioning specific diseases] (350036)
88 37 and 45 and 87 [RCT and elderly and Interventions] (17333)

APA PsycINFO via OvidSP was searched. The database coverage was 1806–present and the database was searched on 9 August 2021.

1 (control: or random:).tw. or exp treatment/[sensitive rct psycinfo search strategy Eady *et al.*, 2009] (1743140)
2 (frail* or prefrailty).tw. (5244)
3 exp aging/(79898)
4 geriatric patients/(13753)
5 geriatrics/(11969)
6 (elder* or older or old people* or old person* or old wom#n*1 or old m#n*1 or old male*1 or old female*1 or old adult*1 or old age* or aging or geriatric* or senior citizen* or seniors or pensioner* or veteran* or sexagenarian* or septuagenarian* or octogenarian* or nonagenarian* or centenarian*).tw. (355903)
7 (over adj2 ('60' or '61' or '62' or '63' or '64' or '65' or '66' or '67' or '68' or '69' or '70' or '71' or '72' or '73' or '74' or '75' or '76' or '77' or '78' or '79' or '80' or '81' or '82' or '83' or '84' or '85' or '86' or '87' or '88' or '89' or '90' or '91' or '92' or '93' or '94' or '95' or '96' or '97' or '98' or '99' or '100') adj years).tw. (2391)
8 or/2–7 [frail or elderly people] (371975)
9 Self-Care Skills/(4756)
10 community health/(3653)
11 community services/(17234)
12 social services/(9557)
13 Community support services.tw. (219)
14 exp managed care/(4567)
15 (health maintenance organi?ation* or HMO*).tw. (2449)
16 (Social adj3 services).tw. (11772)
17 Voluntary services.tw. (71)
18 home visiting programs/(1861)
19 home care/(6905)
20 house call*.tw. (106)
21 (home adj5 visit*).tw. (5619)
22 ((general practice or primary care or nurse* or group or ambulatory clinic or geriatric clinic) adj3 visit*).tw. (2716)

23 (pharmac* adj2 visit).tw. (23)
24 ((home or house) adj2 appointment*).tw. (12)
25 Independent Living Programs/(408)
26 Home care service*.tw. (706)
27 district nursing.tw. (64)
28 health visit*.ti. or health visit*.ab./freq = 2 (342)
29 community matron*.ti. or community matron*.ab./freq = 2 (14)
30 (home adj3 (intervention* or support* or assessment*)).tw. (5172)
31 ((preventive* or preventative*) adj5 medicine).tw. (1085)
32 preventive medicine/(2464)
33 ((preventive* or preventative*) adj3 (program* or intervent* or support* or care or service* or approach* or case management or measure* or OT or occupational therapy or assess*)).tw. (17107)
34 or/9–33 [interventions] (83270)
35 geriatric nursing.tw. (252)
36 (geriatrics/or geriatric patients/) and nursing/(639)
37 or/35-36 [geriatric nursing] (833)
38 community.tw. (275605)
39 community services/or community health/or community mental health services/or pharmacy/(28713)
40 (community healthcare or community health care).tw. (588)
41 home care/(6905)
42 aftercare/(1121)
43 primary health care/(19284)
44 Public Health Service Nurses/(658)
45 (domiciliary or (social support and home*) or ((homecare or medical) adj2 home) or (home and package*) or (outreach and home) or (alternative setting and home) or home visit* or home manag* or homecare or home care or home therap* or (model* adj1 home*) or home program* or home monitor*).tw. (19096)
46 ((live or living or lived or dwell*) adj5 ('at home' or 'own home' or 'in home' or alone or independent*)).tw. (10597)
47 (home-based or homebased or homebound).tw. (5823)
48 (Home care or primary care or primary health care or primary healthcare).tw. (44178)
49 or/38–48 [community or home based] (340141)
50 37 and 49 [geriatric nursing and community or home based] (174)
51 34 or 50 [all interventions] (83378)
52 (coronary heart disease or CHD or chronic obstructive pulmonary disease or COPD or kidney failure or CKD or Heart failure or diabetes or asthma or cancer or schizophrenia or severe mental illness*).ti. (116600)
53 51 not 52 [all interventions except specific diseases in title] (79888)
54 1 and 8 and 53 [RCT filter and elderly and all interventions except specific diseases in title] (7917)

CINAHL via EBSCOhost interface was searched. The database coverage was 1972–present and the database was searched on 9 August 2021.

TABLE 23 Cumulative Index to Nursing and Allied Health Literature search strategy

#	Query	Limiters/ expanders	Last run via	Results
S46	S10 AND S18 and S45	Search modes – Boolean/ Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	10,636
S45	S43 NOT S44	Search modes – Boolean/ Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	106,016
S44	TI ('coronary heart disease' or CHD or 'chronic obstructive pulmonary disease' or COPD or 'kidney failure' or CKD or 'Heart failure' or diabetes or asthma or cancer or schizophrenia or 'severe mental illness*')	Search modes – Boolean/ Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	501,973
S43	S29 or S42	Search modes – Boolean/ Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	113,278
S42	S30 and S41	Search modes – Boolean/ Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	2217
S41	S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40	Search modes – Boolean/ Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	687,262
S40	TX 'Home care' or 'primary care' or 'primary health care' or 'primary healthcare'	Search modes – Boolean/ Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	198,977
S39	TX 'home-based' or homebased or homebound	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	9035
S38	(MH 'Community Health Services')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	22,541
S37	TX ((live or living or lived or dwell*) N5 ('at home' or 'own home' or 'in home' or community or alone or independent*))	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	57,710
S36	TX domiciliary or ('social support' and home*) or ((homecare or medical) N2 home) or (home and package*) or (outreach and home) or (alternative setting and home) or home visit* or home manag* or homecare or 'home care' or 'home therap*' or (model* N1 home*) or 'home program*' or 'home monitor*')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	68,720
S35	(MH 'Primary Health Care')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	67,490

TABLE 23 Cumulative Index to Nursing and Allied Health Literature search strategy (*continued*)

#	Query	Limiters/ expanders	Last run via	Results
S34	(MH 'After Care')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	16,366
S33	(MH 'Community Health Nursing')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	28,024
S32	(MH 'Community Mental Health Services')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	9964
S31	TX community	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	479,269
S30	(MH 'Gerontologic Nursing')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	13,362
S29	S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	111,533
S28	TX ((preventive* or preventative*) N3 (program* or intervent* or support* or care or service* or approach* or case management or measure* or OT or 'occupational therapy' or assess*))	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	47,492
S27	(MH 'Preventive Health Care')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	21,369
S26	TX (home N3 (intervention* or support* or assessment*))	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	10,880
S25	TX 'community matron*'	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	283
S24	TX 'health visit*'	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	8986
S23	TX 'district nursing'	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	2176
S22	MM 'Home Health Care'	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	17,073

continued

TABLE 23 Cumulative Index to Nursing and Allied Health Literature search strategy (*continued*)

#	Query	Limiters/ expanders	Last run via	Results
S21	(MH 'Health Services for the Aged')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	6819
S20	(MH 'Home Visits') or (MH 'Community Living')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	23,215
S19	TX 'Community support services'	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	155
S18	S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	1,209,432
S17	TX (over N2 ('60' or '61' or '62' or '63' or '64' or '65' or '66' or '67' or '68' or '69' or '70' or '71' or '72' or '73' or '74' or '75' or '76' or '77' or '78' or '79' or '80' or '81' or '82' or '83' or '84' or '85' or '86' or '87' or '88' or '89' or '90' or '91' or '92' or '93' or '94' or '95' or '96' or '97' or '98' or '99' or '100') N1 years)	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	7999
S16	TX (aging or ageing or geriatric* or gerontologic* or elderly or 'senior citizen*' or seniors or pensioner* or veteran* or sexagenarian* or septuagenarian* or octogenarian* or nonagenarian* or centenarian*)	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	523,198
S15	TX ((older or elder*) N2 (person or people or adult* or patient* or m?n* or wom?n* or female* or male*))	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	194,690
S14	(MH 'Aged+')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	878,186
S13	(MH 'Geriatrics')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	5708
S12	TX (frail*)	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	18,976
S11	TX (prefrailty)	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	160
S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	1,157,497

TABLE 23 Cumulative Index to Nursing and Allied Health Literature search strategy (*continued*)

#	Query	Limiters/ expanders	Last run via	Results
S9	AB group or AB groups	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	795,542
S8	AB trial or AB Trials	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	299,002
S7	AB randomly	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	96,217
S6	AB (randomised or randomized)	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	221,475
S5	TX 'randomised controlled trial*'	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	26,900
S4	TX 'controlled clinical trial*'	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	10,403
S3	(MH 'Clinical Trials')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	177,904
S2	(MH 'Randomized Controlled Trials')	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	117,892
S1	TX 'randomized controlled trial*'	Search modes – Boolean/Phrase	Interface – EBSCOhost Research Databases Search Screen – Advanced Search Database – CINAHL	

To search ClinicalTrials.gov we used the advanced search interface, and searched the Conditions or Disease field using the following search terms: Frail Elderly Syndrome, frailty syndrome, Age-Related Atrophy, Frailty, Old Age; Debility. The search yielded 861 records.

For the International Clinical Trials Registry Platform (ICTRP) we used the advanced search interface, and used the search syntax older or elderly or frail in Title field and community or complex or independent or independence in Intervention field (with synonyms, all recruitment status). The search resulted in 425 records.

Appendix 2 Description of the components and aspects of components used to determine intervention groups, organised by domain

Domain	Brief name (abbreviation)	Public-facing name	Plain language description
Activities	ADL (ADL)	Practise **day-to-day activities**	The person is offered support to practise carrying out day-to-day activities, for example dressing or taking the bus. The person may also be offered recommendations on how to carry out day-to-day activities safely or better. For example, this may include using appropriate footwear, removing loose rugs, cords and clutter in walking paths or improvement of lighting. The person may receive an assessment to create a tailored day-to-day activities plan.
Activities	Aids (aids)	Get **equipment and technology** to support day-to-day activities	The person is offered equipment or technology to aid in day-to-day activities. This may include ramps, walking frames, grab rails or a system of sensors that turn on the lights when the person gets up from the bed, for example. The person may receive an assessment to choose specific equipment or technology.
Activities	Engagement in meaningful-activities (eng)	Identify and engage in **meaningful activities**	The person is offered support to identify and participate in activities that they find meaningful. Examples may include leisure activities, crafts, volunteering, but the focus is on the activities being ones that the person finds meaningful. The activities may be organised for the person, be done by the person alone themselves, or be community activities that were already in place, for example.
Brain training	Cognitive training (cgn)	Do **brain training**	The person is offered training in thinking tasks such as memorising, paying attention or planning, among others. The training includes practical exercises and information about strategies to help thinking tasks.
Diet/nutrition	Nutrition (ntr)	Get **dietary advice and support**	The person is offered recommendations about diet and/or food supplements in group sessions or one-to-one. This is different from receiving information about nutrition as part of 'Find out more information about health' because there is a greater focus on providing specialised nutrition/dietary advice and related activities. For example, the person may also participate in writing a nutritional diary, cooking certain types of meals and weight monitoring. They may be provided with particular foods or supplements. The person may receive an assessment to create a tailored nutrition plan.
Financial support	Care voucher provision (vchr)	Get a health and care **voucher**	The person is offered a voucher to pay for health and personal care services and support on how to use the voucher.
Financial support	Welfare rights advice (wlfr)	Get advice about **welfare services** with follow-up	The person is offered tailored advice about the welfare services and benefits they can access. This is based on an assessment. Afterwards, the person was offered support in putting the plan in practice and accessing the services and benefits they are entitled to.
General health information	Education (educ)	Find out more **information about health**	The person is offered information about a set of health topics. The topics may include many areas, for example, oral health, nutrition and physical activity. The information may also focus on areas that are more important for the person. The way the information is provided is more structured than the specific advice someone may receive as part of a clinical appointment with a health professional. The person may be offered information in group sessions or on one-to-one contact.
Homecare	Homecare (hmcr)	Receive formal **home care**	The person is offered support services at home by health or care professionals. The services include, for example, nursing care or support with household tasks.
Individualised care	Medication-review (med)	**Optimise my medication**	The person is offered recommendations to change medication. For example, someone may be on too many medicines and be recommended to stop some. The changes to the medication can be provided on their own or as part of a more complete assessment and recommendations (see 'Take part in individualised care planning based on an assessment' for more details).

continued

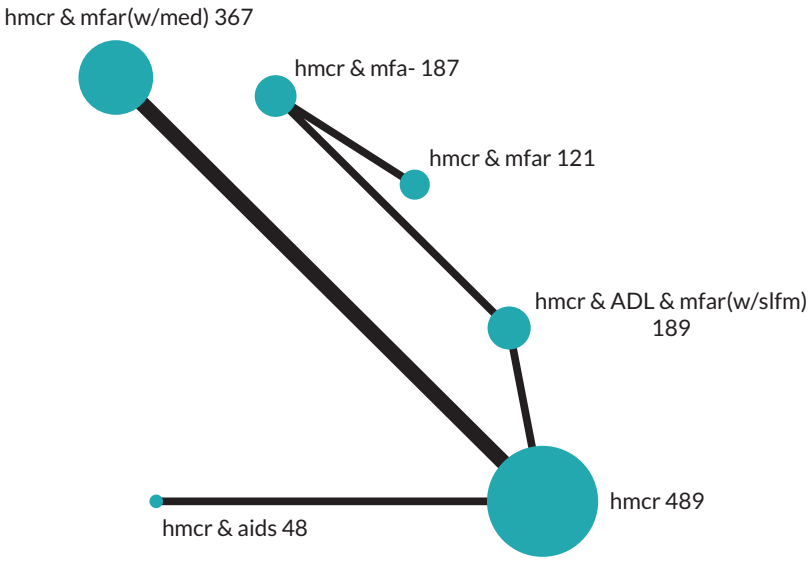
Domain	Brief name (abbreviation)	Public-facing name	Plain language description
Individualised care	Monitoring (mntr)	Get care planning from health **monitoring** (including providing equipment)	If a health need is identified from monitoring, the person is offered an individualised care plan (see 'Take part in individualised care planning' for more details). To check for needs, the person participates in screening and monitoring of their bodily function, for example blood pressure and heart rate. This happens at least weekly. The person is offered equipment to record their bodily function.
Individualised care	Multifactorial-action (mfa)	Take part in **individualised care planning**	The person is offered an individualised care plan that includes recommendations for future action. The care plan is based on an assessment of the person's needs and preferences and may include a variety of actions (related with physical exercise, diet, mood, etc.). The assessment structure may be set in advance or guided by the experience of a clinician. The person may receive support to carry out actions, for example, with referrals to see certain services. The person may also receive support from a care co-ordinator, who helps to deal with different services and/or professionals.
Individualised care	Review [in relation to multifactorial-action] (mfar)	Have **regular follow-ups** (after individualised care planning)	The person is regularly followed up after receiving an individualised care plan based on an assessment. The follow-up may include encouraging the person to carry out previous recommendations. The person may also be offered a new assessment of their needs and other relevant changes, and an updated individualised care plan.
Individualised care	Risk-screening (rsk)	Get care planning following **screening** for possible health problems	A tool to indicate possible health problems is used routinely and, if indicated, the person is offered an individualised care plan (see 'Take part in individualised care planning' for more details). The tool and the results that indicate problems are standardised, such as a questionnaire score or analysis of electronic health records.
Individualised care	Self-management [in multidomain assessment and care planning] (slfm)	Do activities to motivate taking care of yourself (when taking part in individualised care planning)	The person is engaged in conversations or activities designed to motivate them to care for themselves. The person may also be offered guided practice in some techniques, for example, to help them set up personal goals and solve problems.
Alternative medicine	Alternative medicine (hmnt)	Get alternative medicine	The person is offered alternative medicine such as homeopathic or naturopathic consultation and treatment.
Physical exercise	Exercise (exrc)	Do physical **exercise**	The person is offered support to carry out physical exercise. The exercise may be on their own or in training sessions. This is different from receiving information about physical activity as part of 'Find out more information about health' because there is a greater focus on providing specialised physical exercise advice and related activities. Physical exercises are activities done by a person to build up or maintain physical fitness (such as strength, balance, among others). The person may also receive an assessment to create a tailored exercise plan.
Social communication	Social skills training (sst)	Practise **social interaction**	The person is offered information and support to exercise their ability to relate with other people. This may include practising or discussing different ways of communicating.
Social communication	Telecoms (comm)	Get **comm**	The person is offered technology to enable communication with friends, family, neighbours or the community. For example, a tablet, iPad or mobile phone as well as applications such as e-mail or social media. The person will usually receive support in using the applications.
Well-being	Psychology (psyc)	Get **well-being advice and support**	The person is offered support for their well-being in areas like feeling low and dealing with worries. The support includes information about how we usually think and feel, and information and activities to deal with what we think and feel, such as noticing and learning how to overcome unhelpful thoughts.

comm, technology for communication and engagement.

Appendix 3 Additional summary of findings tables

TABLE 24 Instrumental activities of daily living in the medium term: comparisons with homecare summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Homecare (hmcr)
Outcome: Independence in IADL
Time frame: Medium term; range of follow-up 12–18 months
Setting: Community
Total studies: 6
Total participants: 1401
Comparator rank: Mean 4.7, 95% CI 2 to 6



Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Lawton IADL 0 to 8)[a]			
Homecare and aids (hmcr & aids)	SMD 0.27 higher (0.23 lower to 0.77 higher) Mixed estimate	MD 0.71 higher (0.60 lower to 2.02 higher)	⊕⊖⊖⊖Very low[b,c]	2.5 (1 to 6)	The evidence is very uncertain about the effect on IADL independence
Homecare, multifactorial-action and review (hmcr & mfar)	SMD 0.18 higher (0.52 lower to 0.88 higher) Indirect estimate	MD 0.47 higher (1.35 lower to 2.30 higher)	⊕⊖⊖⊖Very low[d,e]	3.0 (1 to 6)	The evidence is very uncertain about the effect on IADL independence
Homecare, ADL training, multifactorial-action and review with self-management [hmcr & ADL & mfar(w/slfm)]	SMD 0.16 higher (0.21 lower to 0.53 higher) Mixed estimate	MD 0.41 higher (0.55 lower to 1.38 higher)	⊕⊖⊖⊖Very low[e,f]	3.1 (1 to 6)	The evidence is very uncertain about the effect on IADL independence
Homecare, multifactorial-action and review with medication-review [hmcr & mfar(w/med)]	SMD 0.15 higher (0.11 lower to 0.41 higher) Mixed estimate	MD 0.38 higher (0.30 lower to 1.06 higher)	⊕⊖⊖⊖Very low[b,c]	3.2 (1 to 6)	The evidence is very uncertain about the effect on IADL independence
Homecare and multifactorial-action (hmcr & mfa-)	SMD 0.01 lower (0.60 lower to 0.58 higher) Indirect estimate	MD 0.02 lower (1.57 lower to 1.52 higher)	⊕⊖⊖⊖Very low[e,g]	4.5 (2 to 6)	The evidence is very uncertain about the effect on IADL independence

continued

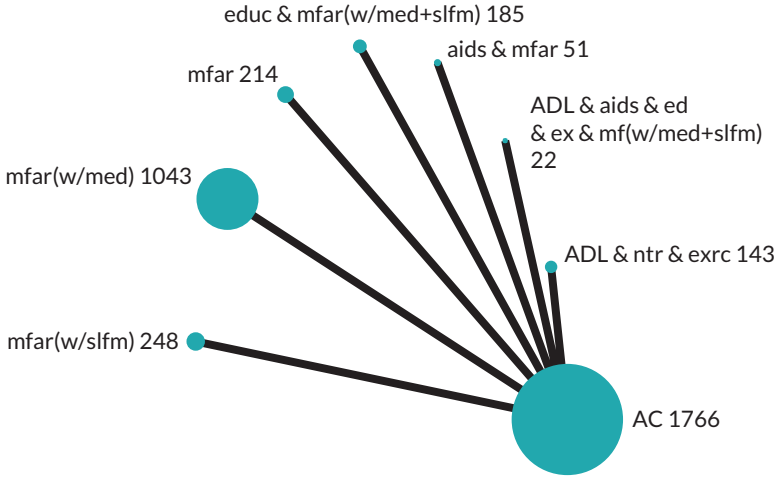
TABLE 24 Instrumental activities of daily living in the medium term: comparisons with homecare summary of findings table (*continued*)

Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (Lawton IADL 0 to 8)[a]			

a Calculated from the estimated SMD using a SD of 2.62, the pooled SD across intervention groups reporting the Lawton IADL.
b Serious concerns about RoB due to missing outcome data. Downgrade once.
c Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
d Very serious concerns about RoB because of missing data and multiple analyses being conducted but the results from only one analysis reported in the indirect evidence via the comparisons of homecare and multifactorial-action (hmcr & mfa-) vs. homecare, ADL, multifactorial-action and review with self-management [hmcr & ADL & mfar(w/slfm)]; and homecare, ADL, multifactorial-action and review with self-management [hmcr & ADL & mfar(w/slfm)] vs. homecare (hmcr). Downgrade twice.
e Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.
f Very serious concerns about RoB because of missing data and multiple analyses being conducted but the results from only one analysis reported. Downgrade twice.
g Very serious concerns about RoB because of missing data and multiple analyses being conducted but the results from only one analysis reported in the in indirect evidence via homecare, ADL, multifactorial-action and review with self-management [hmcr & ADL & mfar(w/slfm)] vs. homecare (hmcr). Downgrade twice.

TABLE 25 Care-home placement in the short term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Care-home placement
Time frame: Short term; range of follow-up 24 weeks to 6 months
Setting: Community
Total studies: 7
Total participants: 3672
Comparator rank: Mean 4.6, 95% CI 3 to 7



Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (28 per 1000 with ac)		Low-risk population (2 per 1000 with ac)				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Multifactorial-action and review with medication-review [mfar(w/med)]	OR 0.77 (0.17 to 3.50) Mixed estimate	RR 0.78 (0.17 to 3.44)	22 per 1000 (5 to 92)	6 fewer per 1000 (23 fewer to 64 more)	2 per 1000 (0 to 7)	0 per 1000 (2 fewer to 5 more)	⊕⊖⊖⊖ Very low[b,c]	2.3 (1 to 7)	The evidence is very uncertain about the effect on care-home placement
Aids, multifactorial-action and review (aids & mfar)	OR 4.02 (0.18 to 89.76) Mixed estimate	RR 3.94 (0.18 to 55.36)	104 per 1000 (5 to 721)	76 more per 1000 (23 fewer to 693 more)	8 per 1000 (0 to 152)	6 more per 1000 (2 fewer to 150 more)	⊕⊖⊖⊖ Very low[d,e]	3.1 (1 to 8)	The evidence is very uncertain about the effect on care-home placement
Multifactorial-action and review (mfar)	OR 2.46 (0.25 to 23.86) Mixed estimate	RR 2.43 (0.25 to 20.57)	66 per 1000 (7 to 407)	38 more per 1000 (21 fewer to 379 more)	5 per 1000 (1 to 46)	3 more per 1000 (1 fewer to 44 more)	⊕⊖⊖⊖ Very low[b,c]	4.0 (1 to 7)	The evidence is very uncertain about the effect on care-home placement

continued

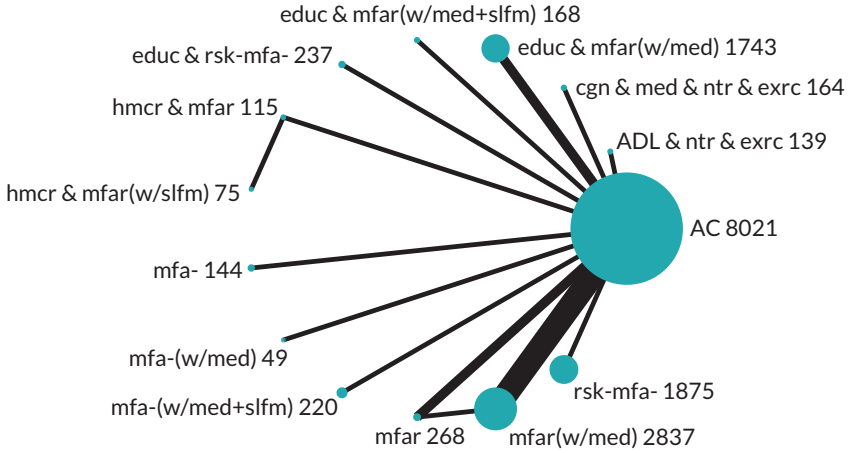
TABLE 25 Care-home placement in the short term: comparisons with ac summary of findings table (*continued*)

	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (28 per 1000 with ac)		Low-risk population (2 per 1000 with ac)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
ADL, nutrition and exercise (ADL & ntr & exrc)	OR 0.99 (0.34 to 2.87) Mixed estimate	RR 0.99 (0.34 to 2.83)	28 per 1000 (10 to 76)	0 per 1000 (18 fewer to 48 more)	2 per 1000 (1 to 6)	0 per 1000 (1 fewer to 4 more)	⊕⊖⊖⊖ Very low[b,c]	4.6 (1 to 8)	The evidence is very uncertain about the effect on care-home placement
Multifactorial-action and review with self-management strategies [mfar(w/slfm)]	OR 0.18 (0.01 to 3.75) Mixed estimate	RR 0.18 (0.01 to 3.68)	5 per 1000 (0 to 98)	23 fewer per 1000 (28 fewer to 70 more)	0 per 1000 (0 to 7)	2 fewer per 1000 (2 fewer to 5 more)	⊕⊖⊖⊖ Very low[e,f]	4.6 (2 to 7)	The evidence is very uncertain about the effect on care-home placement
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	OR 0.33 (0.01 to 8.21) Mixed estimate	RR 0.33 (0.01 to 7.82)	9 per 1000 (0 to 191)	19 fewer per 1000 (28 fewer to 163 more)	1 per 1000 (0 to 16)	1 fewer per 1000 (2 fewer to 14 more)	⊕⊖⊖⊖ Very low[b,c]	6.2 (2 to 8)	The evidence is very uncertain about the effect on care-home placement
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management strategies ADL & aids & educ & exrc & mfar(w/med + slfm)]	OR 0.99 (0.02 to 50.04) Mixed estimate	RR 0.99 (0.02 to 37.25)	28 per 1000 (1 to 590)	0 per 1000 (27 fewer to 562 more)	2 per 1000 (0 to 91)	0 per 1000 (2 fewer to 89 more)	⊕⊖⊖⊖ Very low[g]	6.6 (2 to 9)	The evidence is very uncertain about the effect on care-home placement

a Calculated from OR and an assumed comparator risk of 0.007, the median ac risk among these studies.
b Serious concerns about RoB due to missing outcome data. Downgrade once.
c Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
d Very serious concerns about RoB due to deviations from the intended interventions and missing data. Downgrade twice.
e Very serious concerns about imprecision as confidence interval includes substantial benefit and substantial harm. Already downgraded twice for risk of bias, downgrade once.
f Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.
g Extremely serious concerns about imprecision as confidence interval is extremely wide. Downgrade three levels.

TABLE 26 Care-home placement in the medium term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Care-home placement
Time frame: Medium term; range of follow-up 12–18 months
Setting: Community
Total studies: 20
Total participants: 16,055
Comparator rank: Mean 9.2, 95% CI 6 to 12



Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (50 per 1000 with ac)		Low-risk population (1 per 1000 with ac)[b]				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Homecare, multifactorial-action and review with self-management strategies [hmcr & mfar(w/slfm)]	OR 0.07 (0.01 to 0.53) Indirect estimate	RR 0.07 (0.01 to 0.53)	4 per 1000 (0 to 27)	46 fewer per 1000 (50 fewer to 23 fewer)	0 per 1000 (0 to 1)	1 fewer per 1000 (1 fewer to 0)	⊕⊖⊖⊖ Very low[c,d]	1.6 (1 to 5)	The evidence is very uncertain about the effect on care-home placement
Homecare, multifactorial-action and review (hmcr & mfar)	OR 0.18 (0.04 to 0.78) Mixed estimate	RR 0.18 (0.04 to 0.78)	9 per 1000 (2 to 39)	41 fewer per 1000 (48 fewer to 11 fewer)	0 per 1000 (0 to 1)	1 fewer per 1000 (1 fewer to 0)	⊕⊖⊖⊖ Very low[e,f]	2.9 (1 to 7)	The evidence is very uncertain about the effect on care-home placement
Multifactorial-action (mfa-)	OR 0.32 (0.02 to 6.48) Mixed estimate	RR 0.32 (0.02 to 5.81)	17 per 1000 (1 to 254)	33 fewer per 1000 (49 fewer to 204 more)	0 per 1000 (0 to 6)	1 fewer per 1000 (1 fewer to 5 more)	⊕⊖⊖⊖ Very low[g,h]	5.3 (1 to 14)	The evidence is very uncertain about the effect on care-home placement

continued

TABLE 26 Care-home placement in the medium term: comparisons with ac summary of findings table (*continued*)

	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (50 per 1000 with ac)		Low-risk population (1 per 1000 with ac)[b]		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Multifactorial-action and review (mfar)	OR 0.53 (0.20 to 1.39) Mixed estimate	RR 0.53 (0.20 to 1.38)	27 per 1000 (10 to 68)	23 fewer per 1000 (40 fewer to 18 more)	1 per 1000 (0 to 1)	0 per 1000 (1 fewer to 0)	⊕⊖⊖⊖ Very low[g,h]	5.7 (2 to 12)	The evidence is very uncertain about the effect on care-home placement
Education and risk-screening (educ & rsk-mfa-)	OR 0.59 (0.13 to 2.72) Mixed estimate	RR 0.60 (0.13 to 2.63)	30 per 1000 (7 to 125)	20 fewer per 1000 (43 fewer to 75 more)	1 per 1000 (0 to 3)	0 per 1000 (1 fewer to 2 more)	⊕⊖⊖⊖ Very low[g,h]	6.6 (2 to 14)	The evidence is very uncertain about the effect on care-home placement
Cognitive training, medication-review, nutrition and exercise (cgn & med & ntr & exrc)	OR 0.65 (0.10 to 4.17) Mixed estimate	RR 0.65 (0.10 to 3.91)	33 per 1000 (5 to 180)	17 fewer per 1000 (45 fewer to 130 more)	1 per 1000 (0 to 4)	0 per 1000 (1 fewer to 3 more)	⊕⊖⊖⊖ Very low[g,h]	7.2 (1 to 14)	The evidence is very uncertain about the effect on care-home placement
Multifactorial-action and review with medication-review [mfar(w/med)]	OR 0.81 (0.42 to 1.57) Mixed estimate	RR 0.81 (0.42 to 1.55)	41 per 1000 (22 to 76)	9 fewer per 1000 (28 fewer to 26 more)	1 per 1000 (0 to 2)	0 per 1000 (1 fewer to 1 more)	⊕⊖⊖⊖ Very low[g,h]	7.7 (4 to 12)	The evidence is very uncertain about the effect on care-home placement
Multifactorial-action with medication-review [mfa-(w/med)]	OR 0.91 (0.12 to 7.18) Mixed estimate	RR 0.92 (0.12 to 6.35)	46 per 1000 (6 to 274)	4 fewer per 1000 (44 fewer to 224 more)	1 per 1000 (0 to 7)	0 per 1000 (1 fewer to 6 more)	⊕⊖⊖⊖ Very low[g,h]	8.3 (2 to 14)	The evidence is very uncertain about the effect on care-home placement
ADL, nutrition and exercise (ADL & ntr & exrc)	OR 0.96 (0.13 to 7.29) Mixed estimate	RR 0.96 (0.13 to 6.44)	48 per 1000 (7 to 277)	2 fewer per 1000 (43 fewer to 227 more)	1 per 1000 (0 to 7)	0 per 1000 (1 fewer to 6 more)	⊕⊖⊖⊖ Very low[g,h]	8.6 (2 to 14)	The evidence is very uncertain about the effect on care-home placement

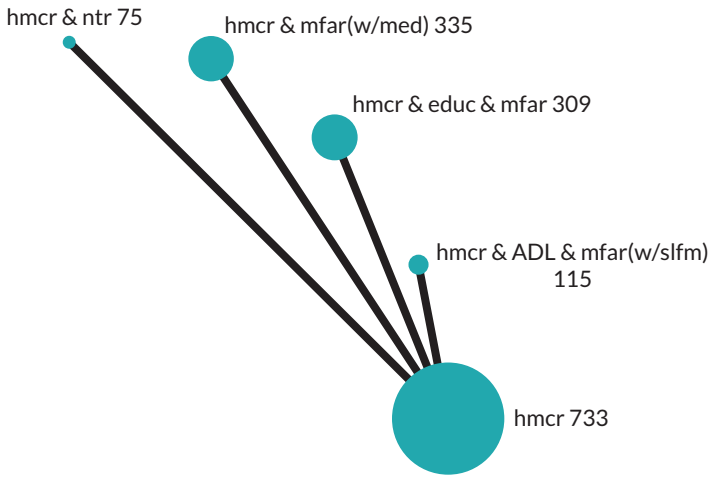
TABLE 26 Care-home placement in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (50 per 1000 with ac)		Low-risk population (1 per 1000 with ac)[b]				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Multifactorial-action with medication-review and self-management strategies [mfa-(w/med + slfm)]	OR 1.01 (0.40 to 2.58) Mixed estimate	RR 1.01 (0.40 to 2.49)	51 per 1000 (21 to 119)	1 more per 1000 (29 fewer to 69 more)	1 per 1000 (0 to 3)	0 per 1000 (1 fewer to 2 more)	⊕⊖⊖⊖ Very low[i,j]	9.3 (4 to 14)	The evidence is very uncertain about the effect on care-home placement
Risk-screening (rsk-mfa-)	OR 1.15 (0.62 to 2.13) Mixed estimate	RR 1.14 (0.62 to 2.08)	57 per 1000 (31 to 101)	7 more per 1000 (19 fewer to 51 more)	1 per 1000 (1 to 2)	0 per 1000 (0 to 1 more)	⊕⊖⊖⊖ Very low[g,h]	10.0 (6 to 14)	The evidence is very uncertain about the effect on care-home placement
Education, multifactorial-action and review with medication-review [educ & mfar(w/med)]	OR 1.23 (0.61 to 2.49) Mixed estimate	RR 1.22 (0.61 to 2.41)	61 per 1000 (31 to 116)	11 more per 1000 (19 fewer to 66 more)	1 per 1000 (1 to 2)	0 per 1000 (0 to 1 more)	⊕⊖⊖⊖ Very low[g,h]	10.4 (5 to 14)	The evidence is very uncertain about the effect on care-home placement
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	OR 2.19 (0.39 to 12.29) Mixed estimate	RR 2.14 (0.40 to 9.93)	103 per 1000 (20 to 393)	53 more per 1000 (30 fewer to 343 more)	2 per 1000 (0 to 12)	1 more per 1000 (1 fewer to 11 more)	⊕⊖⊖⊖ Very low[g,h]	12.1 (4 to 14)	The evidence is very uncertain about the effect on care-home placement

a Calculated from OR and an assumed comparator risk of 0.021, the median ac risk among these studies.
b One per 1000 was given as low risk but two ac groups had lower risks than this.
c Very serious concerns about RoB due to missing outcome data in the indirect evidence via homecare, multifactorial-action and review (hmcr & mfar) vs. ac comparison. Downgrade twice.
d Serious concerns about imprecision as no closed loop and direct evidence is based on 11 events and 155 persons in homecare, multifactorial-action and review (hmcr & mfar) which do not meet optimal information size. Downgrade once.
e Very serious concerns about RoB due to missing outcome data. Downgrade twice.
f Serious concerns about imprecision as no closed loop and direct evidence is based on 14 events and 67 persons in homecare, multifactorial-action and review (hmcr & mfar) which do not meet optimal information size. Downgrade once.
g Serious concerns about RoB due to missing outcome data. Downgrade once.
h Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Downgrade twice.
i Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.
j Very serious concerns about imprecision as confidence interval includes substantial benefit and substantial harm. Already downgraded twice for risk of bias, downgrade once.

TABLE 27 Care-home placement in the medium term: comparisons with homecare summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Homecare (hmcr)
Outcome: Care-home placement
Time frame: Medium term; range of follow-up 12–13 months
Setting: Community
Total studies: 4
Total participants: 1567
Comparator rank: Mean 2.9, 95% CI 1 to 5



	Relative effect (95% CI)		Anticipated absolute effect (95% CI)						
			High-risk population (182 per 1000 with hmcr)		Low-risk population (85 per 1000 with hmcr)		Certainty of the evidence (GRADE)	Ranking (95% CI)	
Intervention group	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			Interpretation
Homecare, education, multifactorial-action and review (hmcr & educ & mfar)	OR 0.86 (0.55 to 1.35) Mixed estimate	RR 0.88 (0.59 to 1.29)	161 per 1000 (110 to 231)	21 fewer per 1000 (72 fewer to 49 more)	74 per 1000 (49 to 111)	11 fewer per 1000 (36 fewer to 26 more)	⊕⊖⊖⊖ Very low[b,c]	2.2 (1 to 5)	The evidence is very uncertain about the effect on care-home placement
Homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)]	OR 0.91 (0.35 to 2.33) Mixed estimate	RR 0.92 (0.39 to 1.97)	168 per 1000 (73 to 341)	14 fewer per 1000 (109 fewer to 159 more)	78 per 1000 (32 to 178)	7 fewer per 1000 (53 fewer to 93 more)	⊕⊖⊖⊖ Very low[d,e]	2.6 (1 to 5)	The evidence is very uncertain about the effect on care-home placement
Homecare, multifactorial-action and review with medication-review [hmcr & mfar(w/med)]	OR 1.12 (0.75 to 1.70) Mixed estimate	RR 1.11 (0.77 to 1.55)	200 per 1000 (142 to 274)	18 more per 1000 (40 fewer to 92 more)	95 per 1000 (65 to 136)	10 more per 1000 (20 fewer to 51 more)	⊕⊖⊖⊖ Very low[d,e]	3.6 (1 to 5)	The evidence is very uncertain about the effect on care-home placement

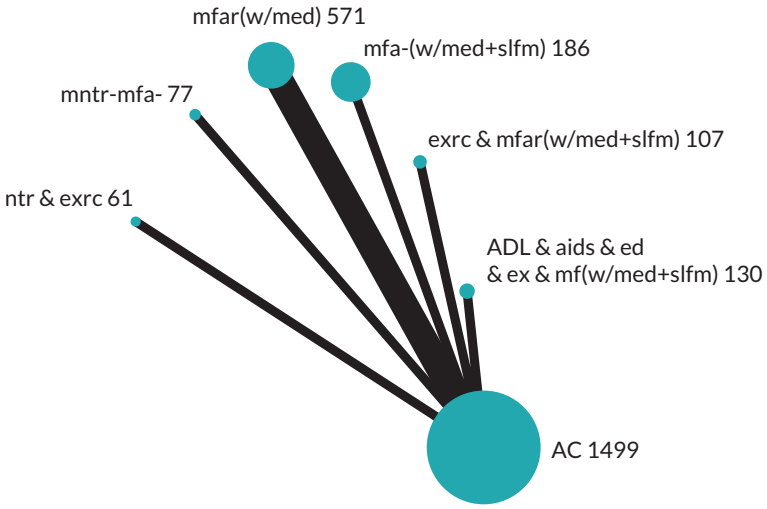
TABLE 27 Care-home placement in the medium term: comparisons with homecare summary of findings table (*continued*)

Intervention group	Relative effect (95% CI)		Anticipated absolute effect (95% CI)				Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
			High-risk population (182 per 1000 with hmcr)		Low-risk population (85 per 1000 with hmcr)				
	Network estimate	Calculated RR[a]	With intervention	Difference	With intervention	Difference			
Homecare and nutrition (hmcr & ntr)	OR 1.37 (0.48 to 3.98) Mixed estimate	RR 1.31 (0.51 to 2.83)	234 per 1000 (96 to 470)	52 more per 1000 (86 fewer to 288 more)	113 per 1000 (42 to 270)	28 more per 1000 (43 fewer to 185 more)	⊕⊖⊖⊖ Very low[d,e]	3.8 (1 to 5)	The evidence is very uncertain about the effect on care-home placement

a Calculated from OR and an assumed comparator risk of 0.136, the median ac risk among these studies.
b Very serious concerns about RoB due to randomisation process, participants were not analysed according to allocation, and missing outcome data. Downgrade twice.
c Very serious concerns about imprecision as CI includes substantial benefit and substantial harm. Already downgraded twice for risk of bias, downgrade once.
d Serious concerns about RoB due to missing outcome data. Downgrade once.
e Very serious concerns about imprecision as confidence interval includes substantial benefit and substantial harm. Downgrade twice.

TABLE 28 Self-reported health in the medium term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Self-reported health (single question)
Time frame: Medium term; range of follow-up 12–18 months
Setting: Community
Total studies: 8
Total participants: 2631
Comparator rank: Mean 4.4, 95% CI 2 to 6

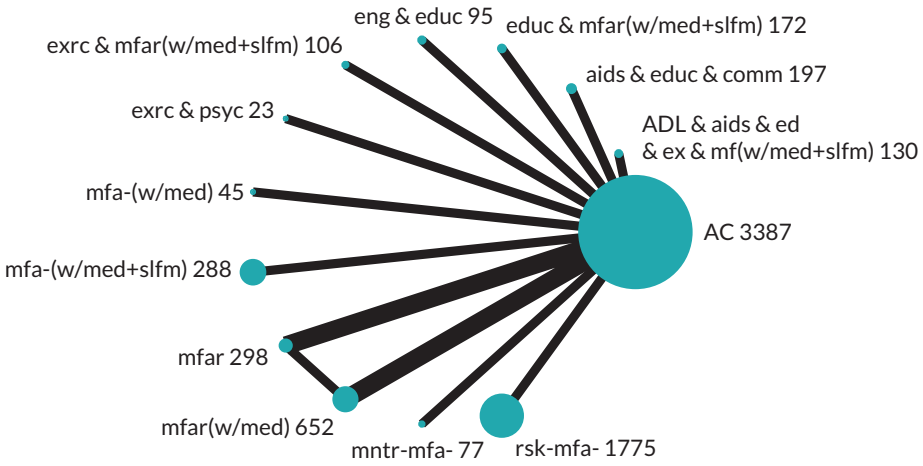


Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (EQ-VAS, 0 to 100)[a]			
Exercise, multifactorial-action and review with medication-review and self-management strategies [exrc & mfar(w/med + slfm)]	SMD 0.01 lower (0.34 lower to 0.32 higher) Mixed estimate	MD 0.20 lower (6.94 lower to 6.53 higher)	⊕⊕⊖⊖ Low[b]	4.3 (1 to 7)	May result in little to no difference in self-reported health
Multifactorial-action and review with medication-review [mfar(w/med)]	SMD 0.11 higher (0.06 lower to 0.28 higher) Mixed estimate	MD 2.24 higher (1.22 lower to 5.71 higher)	⊕⊖⊖⊖ Very low[b,c]	2.6 (1 to 6)	The evidence is very uncertain about the effect on self-reported health
Multifactorial-action with medication-review and self-management strategies [mfa-(w/med + slfm)]	SMD 0.07 higher (0.18 lower to 0.32 higher) Mixed estimate	MD 1.43 higher (3.67 lower to 6.53 higher)	⊕⊖⊖⊖ Very low[d,e]	3.2 (1 to 7)	The evidence is very uncertain about the effect on self-reported health
Nutrition and exercise (ntr & exrc)	SMD 0.07 higher (0.33 lower to 0.46 higher) Mixed estimate	MD 1.43 higher (6.73 lower to 9.38 higher)	⊕⊖⊖⊖ Very low[b,c]	3.4 (1 to 7)	The evidence is very uncertain about the effect on self-reported health
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management strategies [ADL & aids & ed & ex & mf(w/med + slfm)]	SMD 0.06 lower (0.38 lower to 0.25 higher) Mixed estimate	MD 1.22 lower (7.75 lower to 5.10 higher)	⊕⊖⊖⊖ Very low[b,c]	4.9 (1 to 7)	The evidence is very uncertain about the effect on self-reported health
Monitoring (mntr-mfa-)	SMD 0.11 lower (0.47 lower to 0.26 higher) Mixed estimate	MD 2.24 lower (9.59 lower to 5.30 higher)	⊕⊖⊖⊖ Very low[b,c]	5.3 (1 to 7)	The evidence is very uncertain about the effect on self-reported health

EQ-VAS, EuroQol Visual Analogue Scale.
a Calculated from the estimated SMD using a SD of 20.4, the pooled SD across all intervention groups reporting EQ-VAS (0–100) included in this NMA.
b Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.
c Serious concerns about RoB due to missing outcome data. Downgrade once.
d Very serious concerns about risk of bias due to missing outcome data and uncertainty about the randomisation procedure combined with a large imbalance in cluster sizes.
e Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.

TABLE 29 Depression in the medium term: comparisons with ac summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Available care (ac)
Outcome: Depression
Time frame: Medium term; range of follow-up 44 weeks to 18 months
Setting: Community
Total studies: 15
Total participants: 7245
Comparator rank: Mean 7.6, 95% CI 5 to 11



Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (GDS 15)[a]			
Exercise, multifactorial-action and review with medication-review and self-management strategies [exrc & mfar(w/med + slfm)]	SMD 0.11 lower (0.45 lower to 0.23 higher) Mixed estimate	MD 0.35 lower (1.41 lower to 0.72 higher)	⊕⊕⊖⊖Low[b]	4.9 (1 to 12)	May result in a very slight reduction in symptoms of depression
Engagement in meaningful-activities and education (eng & educ)	SMD 0.13 lower (0.46 lower to 0.19 higher) Mixed estimate	MD 0.42 lower (1.44 lower to 0.59 higher)	⊕⊖⊖⊖Very low[c,d]	4.7 (1 to 12)	The evidence is very uncertain about the effect on symptoms of depression
Risk-screening (rsk-mfa-)	SMD 0.09 lower (0.31 lower to 0.14 higher) Mixed estimate	MD 0.28 lower (0.98 lower to 0.43 higher)	⊕⊖⊖⊖Very low[d,e]	5.3 (1 to 11)	The evidence is very uncertain about the effect on symptoms of depression
Multifactorial-action and review with medication-review [mfar(w/med)]	SMD 0.07 lower (0.25 lower to 0.12 higher) Mixed estimate	MD 0.21 lower (0.80 lower to 0.37 higher)	⊕⊖⊖⊖Very low[b,f]	5.6 (1 to 11)	The evidence is very uncertain about the effect on symptoms of depression
Aids, education and telecoms (aids & educ & comm)	SMD 0.05 lower (0.33 lower to 0.24 higher) Mixed estimate	MD 0.15 lower (1.05 lower to 0.76 higher)	⊕⊖⊖⊖Very low[b,f]	6.2 (1 to 13)	The evidence is very uncertain about the effect on symptoms of depression
Exercise and psychology (exrc & psyc)	SMD 0.06 lower (0.59 lower to 0.47 higher) Mixed estimate	MD 0.20 lower (1.87 lower to 1.47 higher)	⊕⊖⊖⊖Very low[d,g]	6.2 (1 to 13)	The evidence is very uncertain about the effect on symptoms of depression
ADL, aids, education, exercise, multifactorial-action and review with medication-review and self-management strategies [ADL & aids & ed & ex & mf(w/med + slfm)]	SMD 0.01 lower (0.33 lower to 0.31 higher) Mixed estimate	MD 0.03 lower (1.03 lower to 0.97 higher)	⊕⊖⊖⊖Very low[b,f]	7.2 (1 to 13)	The evidence is very uncertain about the effect on symptoms of depression

continued

TABLE 29 Depression in the medium term: comparisons with ac summary of findings table (*continued*)

Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (GDS 15)[a]			
Monitoring (mntr-mfa-)	SMD 0.00 (0.37 lower to 0.37 higher) Mixed estimate	MD 0.00 (1.16 lower to 1.16 higher)	⊕⊖⊖⊖Very low[b,f]	7.3 (1 to 13)	The evidence is very uncertain about the effect on symptoms of depression
Multifactorial-action with medication-review and self-management strategies [mfa-(w/med + slfm)]	SMD 0.00 (0.24 lower to 0.24 higher) Mixed estimate	MD 0.00 (0.77 lower to 0.77 higher)	⊕⊖⊖⊖Very low[d,h]	7.5 (2 to 13)	The evidence is very uncertain about the effect on symptoms of depression
Multifactorial-action and review (mfar)	SMD 0.04 higher (0.20 lower to 0.28 higher) Mixed estimate	MD 0.13 higher (0.63 lower to 0.88 higher)	⊕⊖⊖⊖Very low[b,f]	8.6 (2 to 13)	The evidence is very uncertain about the effect on symptoms of depression
Multifactorial-action with medication-review [mfa-(w/med)]	SMD 0.11 higher (0.35 lower to 0.58 higher) Mixed estimate	MD 0.36 higher (1.10 lower to 1.82 higher)	⊕⊖⊖⊖Very low[b,f]	9.3 (1 to 13)	The evidence is very uncertain about the effect on symptoms of depression
Education, multifactorial-action and review with medication-review and self-management strategies [educ & mfar(w/med + slfm)]	SMD 0.17 higher (0.13 lower to 0.47 higher) Mixed estimate	MD 0.53 higher (0.42 lower to 1.48 higher)	⊕⊖⊖⊖Very low[b,f]	10.6 (3 to 13)	The evidence is very uncertain about the effect on symptoms of depression

GDS, Geriatric Depression Scale.

a Calculated from the estimated SMD using a SD of 3.15, the pooled SD across intervention groups reporting the GDS-15 in the medium term.

b Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.

c Very serious concerns about RoB due to randomisation process, missing outcome data and reported results were not analysed according to allocation. Downgrade twice.

d Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.

e Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.

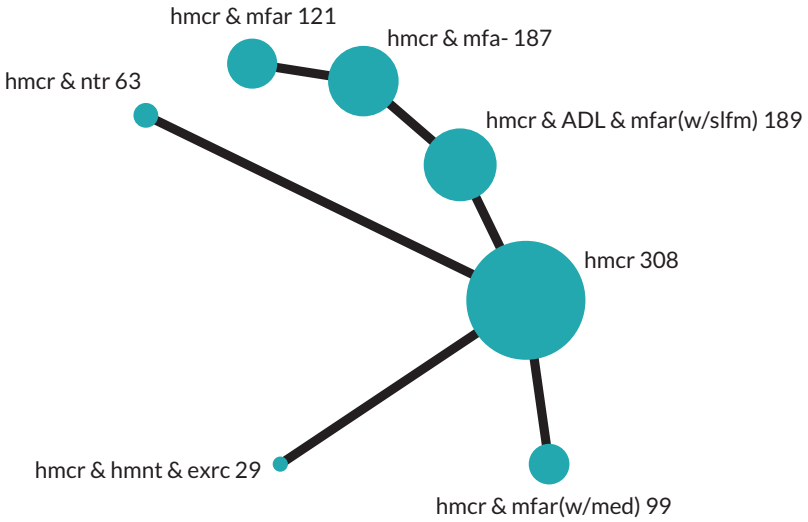
f Serious concerns about RoB due to missing outcome data. Downgrade once.

g Very serious concerns about RoB due to excluding participants in per-protocol analysis and missing outcome data. Downgrade twice.

h Very serious concerns about RoB due to randomisation process and missing outcome data. Downgrade twice.

TABLE 30 Depression in the medium term: comparisons with homecare summary of findings table

Population: Older people
Interventions: Community-based complex interventions
Comparator: Homecare (hmcr)
Outcome: Depression
Time frame: Medium term; follow-up at 12 months
Setting: Community
Total studies: 6
Total participants: 996
Comparator rank: Mean 5.2, 95% CI 3 to 7



Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (GDS 15)[a]			
Homecare, multifactorial-action and review with medication-review [hmcr & mfar(w/med)]	SMD 0.38 lower (0.66 lower to 0.10 lower) Mixed estimate	MD 1.20 lower (2.08 lower to 0.31 lower)	⊕⊕⊖⊖Low[b,c]	1.7 (1 to 4)	May result in a slight reduction in symptoms of depression
Homecare and nutrition (hmcr & ntr)	SMD 0.24 lower (0.62 lower to 0.14 higher) Mixed estimate	MD 0.76 lower (1.95 lower to 0.43 higher)	⊕⊖⊖⊖Very low[b,d]	2.8 (1 to 7)	The evidence is very uncertain about the effect on symptoms of depression
Homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)]	SMD 0.09 lower (0.33 lower to 0.16 higher) Mixed estimate	MD 0.27 lower (1.03 lower to 0.49 higher)	⊕⊖⊖⊖Very low[e,f]	4.0 (2 to 7)	The evidence is very uncertain about the effect on symptoms of depression
Homecare and multifactorial-action (hmcr & mfa-)	SMD 0.09 lower (0.53 lower to 0.35 higher) Indirect estimate	MD 0.28 lower (1.67 lower to 1.11 higher)	⊕⊖⊖⊖Very low[d,g]	4.0 (1 to 6)	The evidence is very uncertain about the effect on symptoms of depression
Homecare, alternative-medicine and exercise (hmcr & hmnt & exrc)	SMD 0.06 lower (0.58 lower to 0.45 higher) Mixed estimate	MD 0.20 lower (1.82 lower to 1.42 higher)	⊕⊖⊖⊖Very low[b,d]	4.4 (1 to 7)	The evidence is very uncertain about the effect on symptoms of depression
Homecare, multifactorial-action and review (hmcr & mfar)	SMD 0.10 higher (0.40 lower to 0.61 higher) Indirect estimate	MD 0.32 higher (1.27 lower to 1.92 higher)	⊕⊖⊖⊖Very low[d,h]	5.9 (2 to 7)	The evidence is very uncertain about the effect on symptoms of depression

continued

TABLE 30 Depression in the medium term: comparisons with homecare summary of findings table (*continued*)

Intervention group	Anticipated absolute effect (95% CI)		Certainty of the evidence (GRADE)	Ranking (95% CI)	Interpretation
	SMD	MD (GDS 15)[a]			

GDS, Geriatric Depression Scale.

a Calculated from the estimated SMD using a SD of 3.15, the pooled SD across all intervention groups reporting the GDS-15 in the medium term.

b Serious concerns about RoB due to missing outcome data. Downgrade once.

c Serious concerns about imprecision as no closed loop and direct evidence is based on 99 persons in homecare, multifactorial-action and review with medication-review [hmcr & mfar(w/med)] which does not meet optimal information size. Downgrade once.

d Very serious concerns about imprecision as CI includes substantial benefit and harm (SMD ± 0.05). Downgrade twice.

e Very serious concerns about RoB due to missing outcome data and the reported results were not analysed in accordance with the protocol. Downgrade twice.

f Very serious concerns about imprecision as confidence interval includes substantial benefit and harm (SMD ± 0.05). Already downgraded twice for risk of bias, downgrade once.

g Very serious concerns about RoB due to missing outcome data and the reported results were not analysed in accordance with the protocol in the indirect evidence via homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)] vs. homecare (hmcr) comparison. Downgrade twice.

h Very serious concerns about RoB due to missing outcome data and the reported results were not analysed in accordance with the protocol in the indirect evidence via homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)] vs. homecare (hmcr) comparison and via homecare, ADL, multifactorial-action and review with self-management strategies [hmcr & ADL & mfar(w/slfm)] vs. homecare and multifactorial-action (hmcr & mfa-) comparison. Downgrade twice.

EME
HSDR
HTA
PGfAR
PHR

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