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Which interventions are cost effective for preventing, slowing or reversing the progression of frailty?

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Briefing Paper

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Summary

Three recent reviews of the evidence considered interventions to prevent, slow or reverse the progression of frailty

Physical exercise interventions (group-based) and **nutritional supplements** can effectively prevent, reduce or reverse frailty

Many other interventions may be effective, but lack evaluative evidence

Costs and cost effectiveness are unknown

The problem

Frailty is a distinctive, age related health state, in which multiple body systems gradually lose their in-built reserves.[1] People with frailty are less able to cope with every day stressors and are at increased risk of poor health outcomes including falls, disability, hospitalisation, and mortality.[2-5] Understanding how best to prevent, slow or reverse the progression of frailty is important for maximising quality of life for older people and their carers.

Method

A rapid review was proposed to address the question: *What interventions are (cost) effective in preventing, reversing or slowing progression of frailty?* Preliminary scoping identified three recently published systematic reviews that answered this question and thus precluded the need for a further review. This document summarises the evidence from these three reviews.

Summary of evidence

Three reviews were identified (table 1): two systematic reviews (one reported across two publications),[6-8] and one scoping review.[9] All were published between 2018 and 2019. We also found a protocol for an overview of systematic reviews, from 2015.[10] However, contact

with the author confirmed their project had changed into an evidence brief rather than a systematic review.

Two of the reviews were restricted to studies of populations aged over 65 years,[6,7,9] one imposed no age limits.[8] People living in institutions (not defined), were included in one review.[6] Interventions evaluated were: physical exercise (group and individual), nutritional supplements, hormone supplements, health education and information, home visits, counselling, cognitive training, problem solving therapy, individually tailored management of the clinical condition, a multidisciplinary team, and multicomponent programmes.

Each review reported the effectiveness of the interventions on the prevention, reduction or reversal of frailty. Evidence about costs was reported in one review,[6] whilst another review used intervention costs as part of a score to describe the ease of implementing an intervention (but did not report these costs in the publication).[8]

Effective interventions for preventing, reversing, or reducing frailty

(Table 2 summarises the evidence from each review).

Across all reviews, **physical exercise** interventions were effective for preventing, reversing, or reducing frailty (and in one review, pre-frailty). Apostolo and colleagues (2018) identified that group-based physical exercise programmes were effective, whilst individual-based exercise programmes were not.[6] Travers and colleagues (2019) ranked physical exercise, combined with protein supplements, as the most effective of all interventions reviewed, and also the easiest intervention to implement.[8] Similarly, Liu and colleagues (2019) recommended resistance and/or strength training, either alone or in combination with other forms of exercise or nutritional education.[9] **Nutritional supplements** were also effective for preventing, reversing, or reducing frailty in two reviews.[6,8]

Only the review by Apostolo and colleagues (2018) graded the strength of evidence for the proposed recommendations. **Evidence for group-based physical exercise and nutritional supplements was considered strong and reliable: both interventions were therefore strongly recommended**. The same review also identified a number of other interventions that *may* be effective for preventing, reversing, or reducing frailty. However, evidence for these interventions was considered weaker: these interventions should therefore be considered with caution (see table 2).

Evidence about costs was limited to one intervention, individually tailored management of patients' clinical conditions, reported in two studies in the review by Apostolo and colleagues (2018). One study, which evaluated individually tailored management of frailty in community settings, reported this intervention offered value for money. The second study, which evaluated individually tailored management of frailty in inpatient and outpatient setting, reported that intervention costs were equivalent to those of usual care.

Interventions not supported by review evidence

Apostolo and colleagues (2018) identified three interventions that were not supported by evidence for preventing, reversing, or reducing frailty: individual exercise programmes, hormone therapy and problem-solving therapy.[6] Similarly, Travers and colleagues (2019) ranked hormone supplements as the least effective, along with home visits and counselling.[8]

Conclusion

This briefing has summarised evidence from three recently published reviews about the effectiveness of interventions to prevent, reduce or reverse frailty. Evidence from these reviews suggest physical exercise programmes (notably group-based) and nutritional supplements are effective for preventing and reversing pre-frailty and frailty. The costs and costs-effectiveness of interventions remains uncertain. The absence of detail on costs presents a key gap in evidence for future research.

Table 1. Summary of reviews about preventing, reversing or slowing progression of frailty

Study	Review type	Population	Intervention(s)	Outcome(s)	Number studies
Apostolo 2018, Marcucci 2019[6,7]	Systematic	Older adults aged 65+ years, classed as pre-frail or frail, in primary or institutionalised care.	Group based physical exercise programmes Home based physical exercise programmes Individual-based physical exercise programmes Nutritional supplements Group and individual education sessions Home visits Multidisciplinary/multicomponent programmes Cognitive training Individually tailored management of clinical condition Problem solving therapy Hormone replacement	Frailty: YES Costs and cost benefits/savings: YES	21
Liu 2019[9]	Scoping	Older adults aged 65+ years living in community.	Individual and group-based exercise Multidisciplinary team Multicomponent interventions comprising a combination: nutrition, psychosocial, prescription.	Frailty: YES Costs and cost benefits/savings: NO	14
Travers 2019[8]	Systematic	No age restriction	Physical exercise Health education Nutritional supplements Home visits Hormone supplements Counselling	Frailty: YES Costs and cost benefits/savings: NO (but marginal costs were used to calculate a score to describe ease of implementation)	46

Table 2. Summary of review evidence and recommendations

Study	Evidence summary
Apostolo 2018, Marccuci 2019[6,7]	Interventions that are strongly recommended for preventing pre-frailty and frailty: • Group based physical exercise programmes • Provision of nutritional supplements Interventions that may be effective for preventing pre-frailty and frailty: • Home based physical exercise programmes to supplement group-based programmes • Group and individual education sessions • Home visits • Multidisciplinary programmes • Cognitive training • Individually tailored management of clinical condition Interventions not supported by the review evidence: • Individual-based physical exercise programmes • Problem solving therapy • Hormone replacement Evidence about costs were limited to two studies evaluating interventions individually tailored to the management of the patient's frailty. One study demonstrated this intervention offered value for money, whilst the second reported that intervention costs were similar to that of usual care.
Liu 2019[9]	Interventions that were effective in reversing or reducing frailty: • Physical exercise programmes (resistance or power/strength training, either alone or in combination with aerobic, balance, and/or coordination training or nutritional education) Effective intervention components for reducing frailty: • Cognitive training with social contact • A psychosocial/life goal support program • Multi-disciplinary primary care that addressed polypharmacy, or which included health coaching
Travers 2019[8]	Most effective interventions to delay or reverse frailty: • Combined strength training exercise and protein supplements Least effective interventions to delay or reverse frailty: • Home visits • Counselling • Hormone supplements

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