External validity of physical activity interventions for community-dwelling older adults with fall risk: a quantitative systematic literature review

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CRD summary
The authors concluded that future research on physical activity interventions to reduce falls among community dwelling older adults should target diverse populations, incorporate behaviour change theories, enable replication and translation, test innovative measures and evaluate feasibility and acceptability. As these recommendations do not appear to be directly related to limitations identified within results they should be interpreted with caution.

Authors' objectives
To assess the reach, efficacy, effectiveness, adoption, implementation and maintenance of physical activity interventions designed to reduce falls among community dwelling older adults.

Searching
PubMed, CINAHL, PsycINFO and the Cochrane Review databases were search from 2000 to 2010 for publications written in English; search terms were reported. References lists from relevant studies and resources were also searched.

Study selection
Quasi-experimental studies or randomised controlled trials (RCT) that included fall prevention physical activity interventions in community dwelling adults aged over 60 years and examined intervention effects on physical activity behaviours, balance, strength or fall occurrence were eligible for inclusion.

Less than half of included studies recruited participants with a fall risk. Some studies targeted participants with other risk factors such as osteoporosis. The median participant age was 76 years (range 68 to 88 years). Studies mainly included mostly women. Most included studies were group based, conducted in community centres, retirement communities, indoor health centres, rehabilitation centres and clinical settings. Where reported, interventions were delivered by various staff, including volunteers, nurses, occupational or physical therapists, physicians and exercise instructors. Interventions included one or more behavioural, affective, or cognitive elements, including education, social support, motivation, self regulation and physical activity. Each intervention lasted from 15 to 120 minutes. Median number of contacts was approximately 15.5. Study duration ranged from two to 52 weeks. All included studies reported health outcomes as fall occurrence (incidence rates, incidence risk ratios, mean difference) and/or fall risk (physical function, balance, strength). One quarter of studies also reported behavioural outcomes.

The authors did not state how many reviewers were involved in the initial identification of relevant studies; however two reviewers were involved in the subsequent selection of studies for inclusion.

Assessment of study quality
External validity was assessed using the reach, efficacy/effectiveness, adoption, implementation and maintenance (RE-AIM) framework. Assessment included reporting of participants, measurement and analysis of outcomes, reporting of intervention and delivery setting and intervention fidelity.

Two reviewers independently assessed study quality, disagreements were resolved by discussion.

Data extraction
Data were extracted based on the RE-AIM framework and reported at percentages or statistical significance.

It appeared that two reviewers independently assessed study quality, disagreements were resolved by discussion.

Methods of synthesis
Narrative synthesis was conducting organised by the RE-AIM framework.
Results of the review

Forty-six studies (11,253, range 16 to 1,200) were included in the review. Experimental designs were used in 76% of studies, 24% used quasi-experimental designs. Follow-up ranged from immediately post study to 24 months. Most studies described participants. Recruitment rates averaged 57%, reported in 43% of included studies. Most studies described the intervention setting and location (72% of studies), staff delivering the intervention (82% of studies) and level of expertise (67% of studies). Attrition rates varied from 1 to 60%, reported in 98% of studies. Average attendance ranged from 18 to 100%, reported in 46% of studies.

Efficacy: Statistically significant intervention effects for fall occurrence were reported in 59% of studies which reported fall occurrence (70% of studies). Statistically significant improvements in at least one fall risk measure were reported in 75% of studies which reported fall risk (87% of studies). The remaining studies reported either statistically insignificant results or statistically significant results in both the intervention and control groups.

Maintenance: At least 26% (12 studies) of interventions were sustained. Five studies with follow-up of at least six months reported 31% to 72% of participants continued physical activities as recommended.

Cost information

Intervention implementation costs were $14.87, $80.00 and 487 NZD per participant (reported in three studies).

Authors' conclusions

To foster translational research, further intervention research is needed to: target diverse populations; incorporate theories of behaviour change; describe and operationalise critical content to enable replication and translation; test innovative measures of fall risk; and evaluate feasibility and acceptability.

CRD commentary

The review question was clear and inclusion criteria were defined. Relevant databases were searched, but language restriction imposed meant that some studies may have been missed. Some effort was made to reduce the likelihood of bias and error in the selection of studies, extraction of data and quality assessment. The criteria used to assess study quality seemed appropriate and individual study details were provided within supplementary tables.

Given the differences between studies a narrative approach seemed appropriate. The authors' conclusions referred only to recommendations for future research and did not refer to efficacy or maintenance outcomes. As these recommendations do not appear to be directly related to weaknesses or limitations identified within the results they should be interpreted with caution.

Implications of the review for practice and research

Practice: The authors stated that nurses could encourage physical activity that reduced fall risk among their individual clients and within their organisations and communities.

Research: No recommendations in addition to those in the conclusion were stated.

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