Long-term follow-up and objective physical activity measurements of community-based physical interventions in adults: a systematic review and meta-analysis.

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Abstract

Background
Physical inactivity is a global public health concern. Systematic reviews indicate that interventions can increase short-term physical activity levels. However, long-term health benefits require sustained physical activity increases and systematic review evidence from interventions with objective measures of physical activity beyond 12 months is lacking. This review aimed to identify and describe randomised trials in adults with objective physical activity measures and follow-up beyond 12 months and evaluate the extent to which intervention effects are sustained beyond 12 months

Methods
We searched MEDLINE, EMBASE, PsycINFO, Web of Science, Cochrane Library, CINAHL, and ASSIA between Jan 1, 2000, and April 16, 2018, restricting our search to publications in English, with a combination of the key search terms "physical activity", "objective physical activity measures", and "randomised controlled trial". We included trials reporting long-term effects (≥12 months) on objective physical activity (step count and moderate-to-vigorous physical activity) with community-based participants, aged 18 years and older, without specific medical conditions. Studies in which control participants received physical activity interventions were excluded. Two independent reviewers completed data extraction. We did meta-analyses using random effects models and at different follow-up points. Outcomes were daily step counts and weekly minutes of moderate-to-vigorous activity. This study was registered with PROSPERO, CRD42017075753.

Findings
Of the 17233 unique records identified by our search, we included nine studies in the review and five in the meta-analyses. Interventions included individual walking programmes, group-based sessions, and a school volunteering programme. Follow-up ranged from 12 months to 4 years. The age range of participants was 18–89 years. We observed physical activity increases at 12 months for intervention group participants versus control participants in steps per day (mean difference 554 steps, 95% CI 384–724, p<0·0001; 2446 participants in four studies) and weekly minutes of moderate-to-vigorous physical activity (35 min, 27–43; p<0·0001; 2647 participants in four studies). This increase was sustained up to 4 years for both steps per day (494 steps, 251–738; p<0·0001; 1944 participants in four studies) and weekly minutes of moderate-to-vigorous physical activity (25 min, 13–37; p<0·0001; 1458 participants in three studies).

Interpretation
We found evidence of physical activity intervention effects beyond 12 months, sustained up to 4 years for both steps per day and minutes of moderate-to-vigorous physical activity, with important implications for potential long-term health benefits. However, few physical activity interventions with objective measures had follow-up beyond 12 months.

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