Workplace physical activity interventions: a systematic review

To QG, Chen TT, Magnussen CG, To KG

CRD summary
The review concluded workplace interventions that had less rigorous research designs, used pedometers, applied internet-based approaches and included activities at social and environmental levels were more likely to report being effective in improving physical activity than those without these characteristics. The authors’ conclusions reflect the evidence presented but the poor quality of the included studies potentially limits their reliability.

Authors’ objectives
To assess the effectiveness of workplace interventions in improving physical activity.

Searching
Electronic databases (including MEDLINE, Academic Search Complete, CINAHL, ERIC and PsycINFO) were searched from 2000 to 2010 for peer-reviewed articles published in English. Search terms were reported.

Study selection
Studies of interventions conducted in the workplace aimed at improving the physical activity of employees were eligible for inclusion. Randomised controlled trials (RCTs), controlled quasi-experimental studies and single pre-post test studies could be included. The primary outcomes of interest were change in physical activity, energy consumption and/or body mass index (BMI).

Most of the studies focused on a range of physical activity including staircase promotion and walking circuit, action days, gymnastic break and physical activity campaigns (details provided). Some studies also targeted nutrition. Over half used theoretical models, most based on models of health behaviour change. The duration of interventions ranged from six weeks to two years. Nearly half the studies were conducted in the USA, with the remaining in Belgium, Canada, the Netherlands, Australia, Denmark and Switzerland, or were multinational (including one in the United Kingdom). Most studies recruited participants from government-related agencies, academic or medical settings, other were recruited from manufacturing plants, financial service firms, bus garages, fire departments or multiple organisations.

Most participants were 38 years old or older. Most studies included a majority of female participants. Most participants were overweight at the time of taking part in the interventions. Generally, outcomes were measured with self-report measures. Response rates (employees with complete follow-up data as a proportion of those enrolled with complete baseline data) ranged from 25% to 96%, and the proportion of participation (those enrolling at baseline as a proportion of the total number of employees) ranged from 3% to 78%. Pedometers or accelerometers were used in some studies.

The authors did not state how many reviewers selected studies for inclusion.

Assessment of study quality
Two independent reviewers assessed study quality using the Delphi technique. Criteria included randomisation, concealment of treatment allocation, similarity of groups at baseline, eligibility criteria specified, blinding of outcome assessor, point estimates and measures of variability for primary outcome measures, and intention to treat analysis with a maximum score of seven points. Disagreements were resolved through discussion or referral to the first author.

Data extraction
Data on physical activity, BMI, and energy consumption were extracted and grouped by study design. Statistically significant differences between groups presented. The authors did not state how many reviewers extracted data.

Methods of synthesis
Data were narratively described.

Results of the review
Twenty studies (9,865 participants) were included in the review: twelve RCTs, five quasi-experimental controlled studies and three pre-test and post-test studies. Participant sample sizes ranged from 35 to 1,442. Two studies scored 5 points for quality, four scored 4 points, eight studies scored 3 points, four scored 2 points and two scored 1 point. Twelve RCTs reported randomisation, but only one RCT reported concealment of treatment allocation and two RCTs reported blinding of outcome assessor.

**RCTs (twelve studies):** Five RCTs reported significant improvements in physical activity measures for intervention groups compared to control. The remaining seven RCTs reported no significant differences between groups for any outcome measure.

**Quasi-experimental studies (five studies):** Four quasi-experimental studies reported significant improvements in at least one physical activity outcome; one study reported a reduction in physical activity, but less for the intervention group than the control group.

**Pre-test/post-test studies (three studies):** All three studies reported significant improvements in at least one physical activity outcome.

Interventions with a duration of less than six months reported positive changes in at least one outcome of physical activity for nine out of 11 studies, including seven studies using pedometers. Interventions with a duration of more than six months reported significant positive changes in at least one outcome in three of nine studies. Other results were reported.

Among effective interventions the range of changes were: step counts from 126 to 3,541 steps per day; energy expenditure from 176.18 to 370 kcal per day; BMI from -0.04 to -1.0 BMI unit (kg/m$^2$); and metabolic equivalent of task minutes from 205.8 to 887.25.

**Authors' conclusions**
Workplace interventions that had less rigorous research designs, used pedometers, applied internet-based approaches, and included activities at social and environmental levels were more likely to report being effective in improving physical activity than those without these characteristics.

**CRD commentary**
The review question and inclusion criteria were clearly described. Several relevant sources were searched. However restriction to peer reviewed publications in English means some studies may have been missed. A quality assessment was conducted and results reported in full; most studies were of low quality. Appropriate methods to reduce reviewer error and bias were reported for quality assessment, but it is unclear whether similar methods were used for the selection of studies and extraction of data. A narrative synthesis was appropriate given the variation between studies in terms of participants, setting, interventions and measurement of outcomes. However details in the tables were limited for outcome measures and participants. The data on specific changes in outcomes were reported without reference to particular studies so it is not possible to verify the findings.

The authors highlight some limitations including the poor quality of most of the included studies (including the RCTs), the limited representativeness of the participants, use of self-report questionnaires which are liable to reporting and recall bias, and lack of reporting of statistical data and analysis in the original studies.

The authors' conclusions reflect the evidence presented but the poor quality of the included studies potentially limits their reliability.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that further robust research was needed and listed a range of implications for research such as: designing future interventions to attract men and women; involve employers in long-term commitment to programmes; focus interventions on the social and environmental level; and combine internet-based approaches with use of pedometers. Recommendations for more comprehensive and robust reporting of evaluations were also stated.
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