Effectiveness of exercise-referral schemes to promote physical activity in adults: systematic review

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CRD summary
The authors concluded that physical activity levels in sedentary adults were only slightly improved by primary-care based exercise referral schemes. Overall, this was a well-conducted and clearly reported review and the authors' conclusions reflect the limited evidence.

Authors' objectives
To determine if exercise referral schemes increased participation in exercise in sedentary adults.

Searching
MEDLINE, CINAHL, EMBASE, AMED, PsycINFO, SPORTDiscus, The Cochrane Library and SIGLE databases were searched from inception to March 2007. Search terms were reported. No language restrictions were applied. In addition, reference lists of reviews and included studies were screened.

Study selection
Randomised controlled trials (RCTs), non-randomised controlled studies, observational studies, process evaluations and qualitative studies that evaluated referral to physical exercise schemes of adults by primary care clinicians were eligible for inclusion. Exercise interventions had to be aimed primarily at increasing physical activity and had to include an initial assessment, tailored programme, supervision and monitoring. Studies could evaluate any outcome. The review assessed the proportion of people who were moderately active (at least 90 to 150 minutes of moderate intensity exercise per week) and anthropometric, physiological, biochemical and psychological outcomes.

Most participants in controlled studies were middle-aged adults with sedentary lifestyles and cardiac risk factors. Reported interventions included one or more of the following: gym-based referral scheme; walking scheme; exercises class; and exercise advice. Where reported, the duration of interventions in RCTs ranged from 10 weeks to two years (reported in tables), although the text stated 10 to 12 weeks.

Two reviewers independently selected studies and resolved disagreements by discussion.

Assessment of study quality
Two reviewers independently assessed study quality using separate checklists for RCTs and non-randomised controlled studies (reporting, external validity, internal validity and power), surveys (design, conduct, analysis and interpretation) and qualitative studies (meaning, context, sampling, data quality, theory and generalisability). The maximum score possible was 34 points. Disagreements were resolved by consensus. The quality of process evaluations was not formally assessed.

Data extraction
The authors stated neither how data were extracted for the review nor how many reviewers performed the data extraction. For each controlled study, the number (percentage) of patients who withdrew/were lost to follow-up was reported in tables.

Methods of synthesis
The studies were grouped by study design and outcome. Data from homogeneous RCTs were pooled and relative risks with 95% confidence intervals (CI) calculated for the programme effect on the proportion of patients who were moderately active. Statistical heterogeneity was assessed using the X² statistic and the I² statistic. The number needed to treat was also calculated. The meta-analysis was repeated using a random-effects model. Studies reporting other outcomes and non-controlled studies were combined in a narrative synthesis.
**Results of the review**

Eighteen studies were included: six RCTs (n= 9,030); one non-randomised controlled study (n=58); four observational studies (n=1,284, included two surveys and two cohort studies); and six process evaluations (n>1,276) and one study (n=30) that only reported qualitative data.

**Controlled studies:** Study quality scores ranged from 15 to 29 (median 26) out of 34.

**RCTs:** All RCTs scored 19 or more points for quality. Methodological limitations included lack of generalisability of the sample, lack of blinding and inadequate allocation concealment. Participation rates ranged from 26% to 92%; fewer than half of study entrants completed the exercise programme. Exercise referral schemes were associated with a statistically significant increase in the proportion of patients who were moderately active compared to controls (relative risk based on intention-to-treat analysis 1.20, 95% CI: 1.06 to 1.35; number needed to treat 17). No significant heterogeneity was found. Results for random-effects models were similar.

**Observational studies:** Studies were of poor to moderate quality. Response rates were 40% to 55% in two UK surveys. Studies reported mixed findings (details were reported).

Results for specified anthropometric, physiological, biochemical and psychological outcomes for RCTs and other results from observational studies, process evaluations and qualitative studies were also reported.

**Cost information**

Two RCTs reported unit costs per exercise session of £4 and £8. One RCT found that exercise interventions were more costly and only marginally more effective than advice; the analysis included health-service, participant and exercise programme costs.

**Authors' conclusions**

Physical activity levels in sedentary adults were only slightly improved by primary-care based exercise referral schemes. Further research was required.

**CRD commentary**

The review question was clearly stated and inclusion criteria appropriately defined. Several relevant sources were searched and no language restrictions were applied. No specific attempts to locate unpublished studies were reported. Study validity was assessed using criteria determined by study design and results were reported. Appropriate methods were used to minimise reviewer error and bias during the selection of studies and assessment of validity, but it was unclear whether similar methods were used for data extraction. Studies were grouped appropriately by study design and only RCTs were included in the meta-analysis. The narrative synthesis was clearly reported. Overall, this was a well-conducted and clearly reported review. The authors’ conclusions reflect the limited evidence and their recommendations for future research appeared appropriate.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that there was a need for well-conducted qualitative studies to examine barriers to exercise participation in more depth. More RCTs were required to evaluate methods of overcoming identified barriers and other types of physical activity. Studies should keep control interventions separate from interventions. Health-economic evaluations were also required.

**Funding**

All Wales Alliance for Research Development in Health and Social Care, Welsh Assembly Government.

**Bibliographic details**
