Exercise is an effective treatment modality for reducing cancer-related fatigue and improving physical capacity in cancer patients and survivors: a meta-analysis

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CRD summary
The authors concluded that exercise interventions were beneficial for reducing cancer-related fatigue for patients and survivors of diverse cancer sites and treatment stages. The authors' conclusions reflect the evidence presented but the reliability of the conclusions is uncertain given the lack of quality assessment and small number of studies for some analyses.

Authors' objectives
To evaluate the effects of exercise intervention strategies for the management of cancer-related fatigue.

Searching
PubMed, CINAHL, PsycINFO, ProQuest and SPORTDiscus were searched. Search dates were not reported. Broad search terms were reported. There was a handsearch of relevant journals (details not reported). Reference lists of relevant reports, meta-analyses and literature reviews were checked.

Study selection
Eligible studies were of exercise programmes used to treat cancer-related fatigue in adults (18 years or older) who had been diagnosed or treated for cancer. Exercise programmes included aerobic or resistance training aimed at improving aerobic or musculoskeletal fitness in supervised and home-based settings. Eligible study designs were pre-post test study, quasi-experimental or true experimental study design. Control groups had to be care as usual without prescribed physical activity. Included studies had to report adequate data for statistical analysis. Studies focused only on improvements in range of motion were excluded.

Most interventions included aerobic exercise. The rest used resistance training or a combination of aerobic and resistance training. Most studies took place in a supervised setting. Duration of interventions ranged from three weeks to 24 weeks. Intensity of the interventions varied widely between studies. The mean age of participants was 56.2 years. Half of the studies included participants with breast cancer; other participants had various cancer diagnoses. Studies used exercise as an intervention during or following completion of adjuvant treatment. Various assessment tools were used to assess cancer-related fatigue. Studies were conducted between 1999 and 2010.

Two reviewers independently selected studies for inclusion. Disagreements were resolved through discussion.

Assessment of study quality
The authors did not state that they assessed study quality.

Data extraction
Data on differences between post-test outcome scores for the intervention and control groups were extracted to enable calculation of the standardised mean effect size (SMD) and corresponding 95% confidence intervals (CIs). Effect sizes were categorised as small (0.2 to 0.5), medium (0.5 to 0.8) and large (>0.8).

The authors did not state how many reviewers extracted data.

Methods of synthesis
A fixed-effect meta analysis was undertaken to calculate weighted standardised mean differences. Statistical heterogeneity was assessed using the X² test. Subgroup analyses were conducted on intervention and disease variables.

Results of the review
Sixteen studies (1,429 participants, range 21 to 242) were included in the review. These were all controlled studies although study design was not stated explicitly. Two studies reported using two experimental groups with one control...
There was a small but significant reduction in cancer-related fatigue in favour of exercise compared to control (SMD 0.28, 95% CI 0.17 to 0.38; 18 comparisons). There was no significant heterogeneity.

There were significant reductions in cancer-related fatigue for aerobic exercise programmes (SMD 0.25, 95% CI 0.12 to 0.38; 13 comparisons). There were no significant differences between groups for resistance training programmes (three comparisons) or mixed training programmes (two comparisons).

Studies conducted in supervised settings reported significant reductions in cancer-related fatigue for exercise groups compared to control groups (15 comparisons). Studies conducted in unsupervised settings showed no significant differences between groups (three comparisons).

Significant improvements in cancer-related fatigue were found for exercise programmes conducted during or following treatment in patients with breast or other types of cancer and on aerobic and musculoskeletal physical fitness.

There was evidence of statistical heterogeneity for some subgroup analyses (aerobic-resistance programmes, exercise post-treatment, patients with breast cancer and aerobic physical fitness).

Authors’ conclusions
Exercise interventions were beneficial for reducing cancer-related fatigue for patients and survivors of diverse cancer sites and treatment stages.

CRD commentary
The review question was clear with appropriate inclusion criteria specified. Several relevant sources were searched. Search dates were not reported but the review included studies from 1999 to 2010. It was unclear whether any language restrictions were applied so potential for language bias was uncertain. It appeared that only published studies were included and no formal assessment of publication bias was undertaken.

The methodological quality of the included studies was not assessed so it was difficult to determine the reliability of the evidence presented. Appropriate methods to reduce reviewer error and bias were used for study selection; whether similar methods were used for data extraction was unclear.

Studies were combined in a meta-analysis using a fixed-effect model. A random-effects model may have been more appropriate given the significant statistical heterogeneity for some outcomes. The authors conducted subgroup analyses to explore some differences in between-study characteristics. Some subgroup analyses had few comparisons and may have been underpowered.

The authors conclusions reflect the evidence presented but the reliability of the conclusions is uncertain given the lack of quality assessment and small number of studies for some analyses.

Implications of the review for practice and research
Practice: The authors stated that exercise should be considered as a treatment option in the management of cancer-related fatigue.

Research: The authors stated that further rigorous research was needed to determine the effects of exercise on potential underlying mechanisms related to the pathophysiology of cancer-related pain. Future studies should include adequate methodology (blinding, larger sample sizes, rigorous inclusion criteria and control groups). Future studies should include cancer-related fatigue as an eligibility criterion and investigate further resistance and mixed training programmes. There was a need for studies on unsupervised exercise.

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