
Design: Meta-analysis of randomized clinical trials

PICOS:
- **Patients:** Workers with a primary diagnosis of nonspecific low back pain for at least 4 weeks
- **Interventions:** Exercise alone or as part of a multidisciplinary treatment
- **Comparison intervention:** Usual care or another form of exercise
- **Outcomes:** Work disability defined as sick leave days, physician’s judgment of work capability, or numbers of workers returning to full time work (RTW)
  - Most analyses for RTW were odds ratios (OR) for return to work: an OR significantly less than 1 meant that exercise was better than usual care (usual care had lower odds of RTW); an OR greater than 1 meant that usual care was better (had greater odds of RTW)
- **Studies:** Randomized controlled trials

Study search and selection:
- Databases included MEDLINE, PEDro, Cochrane Library, PsycINFO, through 2008
- References at the end of retrieved articles were searched for further trials
- Two authors independently applied the admission criteria for included studies and rated the risk of bias; a third researcher was consulted to resolve disagreements
- Study quality was based on 3 criteria relating to control of bias: selection bias, detection bias, and attrition bias
  - Selection bias was considered as controlled if the generation of the allocation sequence was based on computer-generated random numbers, drawing of lots, or other random process, and if the allocation sequence was concealed from patients and investigators who were enrolling patients
  - Detection bias was considered controlled if the assessment of outcomes was done by an observer who did not know the patient’s treatment assignment
  - Attrition bias was controlled if the analysis were done by the intention-to-treat principle: if all patients were analyzed in their original groups, regardless of whether they had dropped out of the trial or crossed over to a different treatment group

Results:
- 838 articles were retrieved in the literature search; 87 were evaluated in detail, and 23 studies were selected for review
Most of the article rejections were done either because the primary diagnosis was other than nonspecific low back pain (n=26) or because less than 90% of the patients were available for the job market (n=13).

Of the 23 studies selected for review, 20 had data presented in a form that was suitable for meta-analysis:
- 17 studies had data comparing exercise with usual care
- 11 studies had data comparing two types of exercise
- Trials comparing 2 forms of exercise with usual care were treated as 2 trials, with the same sample size of usual care equally divided between the 2 exercise intervention groups.

Exercise dose was determined by the number of hours of supervised treatment sessions and their duration; interventions with at least 17 hours of supervised exercise were classed as high-dose, and interventions with less than 17 hours of supervised exercise as low dose.

Short-term follow-up was defined as the measurement closest to 4 weeks, intermediate terms as closest to 6 months, and long-term as closest to 12 months.

In the short term, there was not a statistically significant difference for work disability for 5 high-quality studies with 6 comparisons involving 1030 workers:
- Odds ratio (OR) was 0.80 in favor of exercise, but the 95% confidence interval (CI) was from 0.51 to 1.25.

In the intermediate term, 4 high-quality studies with 5 comparisons involving 971 workers showed no significant effect of exercise in reducing work disability:
- OR was 0.78, 95% CI, 0.45-1.34.

In the long term, 8 high-quality studies involving 1992 workers showed a significant effect of exercise in reducing work disability:
- OR was 0.66; 95% CI, 0.54-0.91.

Although the OR did not reach statistical significance, there was a trend toward greater RTW success when the exercise involved more supervision and had a behavioral treatment approach.

No one exercise intervention was shown to be superior to others.

High-dose exercise did not have a greater effect than low dose exercise.

Authors’ conclusions:
- The OR of 0.66 for RTW in the long term means that the odds of improvement in work disability are 34% lower if only usual care, rather than exercise, is given.
- There was considerable heterogeneity in the estimate of the effect of exercise between studies, even though all but one of the studies were done in Europe, with similar social systems.
- There was not an expected dose-response relationship between exercise and RTW, but this must be interpreted with caution, because of incomplete reporting and the lack of the amount of exercise actually done in the home-based exercise programs.
Comments:

- Although the presentation of the meta-analysis is interpretable, the forest plots (Figure 2 and Figure 4) have only the odds ratios, and not the number of participants who did and did not have successful RTW, as is usual practice in the Cochrane Reviews.

- The number of sick days was examined, but not used in meta-analysis, probably due to the skewed distribution of the number of sick days.

- A decision was made not to look at the risk of performance bias (arising from unequal co-interventions between groups).
  
  o Although this is a common criterion for determining control of bias and study quality, it may have been somewhat arbitrary to define what constituted a co-intervention in the groups receiving usual care with a variety of different components.

- Much of the heterogeneity could have arisen from the differing kinds of exercise; even though no one exercise could be shown to have a statistically significant advantage over any other, the effects of differing programs could be sufficient to introduce considerable heterogeneity in the meta-analysis.

Assessment: Adequate for good evidence that exercise programs reduce long-term work disability and improve return to work.