Effectiveness of workplace rehabilitation interventions in the treatment of work-related upper extremity disorders: a systematic review

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CRD summary
This review assessed workplace rehabilitation interventions for work-related upper extremity disorders (WRUEDs). The authors concluded that there was insufficient evidence to adequately assess workplace interventions for WRUEDs and that further research is required. The included studies were small and of poor quality. The authors' conclusions are likely to be reliable.

Authors' objectives
To assess workplace rehabilitation interventions for work-related upper extremity disorders (WRUEDs).

Searching
MEDLINE, CINAHL, EMBASE were searched from January 1982 to May 2003 for reports in the English language; the search terms were listed. The reference lists in retrieved articles were also checked.

Study selection
Study designs of evaluations included in the review
Primary research studies with one or more patients groups were eligible for inclusion. Case reports were excluded.

Specific interventions included in the review
Studies of treatment (not prevention) given at the workplace were eligible for inclusion. Ergonomic modifications and worksite analysis were included. The included studies used the following interventions: exercises; in-house or worksite physical therapy; worksite analysis; nurse case managers' training on accommodations; and ergonomic modifications.

Participants included in the review
Studies of participants with WRUEDs were eligible for inclusion. Patients with neck and upper extremity disorders were included, whereas those with only neck disorders were excluded. The participants included hospital and university workers, computer users and claimants with compensable time lost.

Outcomes assessed in the review
Inclusion criteria were not specified in terms of the outcomes. The included studies assessed pain, tension, work time lost, absenteeism, modified work days, accommodations recommended and implemented for work environment, function, recovery and deterioration.

How were decisions on the relevance of primary studies made?
Four reviewers independently scanned abstracts and any disagreements were discussed at a consensus meeting. Two reviewers then independently selected full papers for inclusion.

Assessment of study quality
The studies were assessed and scored using the 24-item Evaluation Guidelines for Rating the Quality of an Intervention Study Form, which included items for study design, participants, interventions, outcomes and analysis. The maximum possible score was 48. Two reviewers independently assessed validity and resolved any disagreements through discussion, or through recourse to a third reviewer.

Data extraction

Database of Abstracts of Reviews of Effects (DARE)
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The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

**Methods of synthesis**

*How were the studies combined?*

The studies were grouped by intervention and a narrative synthesis was undertaken.

*How were differences between studies investigated?*

Differences were discussed with respect to the interventions and study quality.

**Results of the review**

Eight studies (n=750) were included: 4 randomised controlled trials (RCTs; n=234), 3 cohort studies (n=463) and one case series (n=53).

Overall, the quality of studies was rated as fair (5 studies scored at least 32 out of 48 on validity); the scores ranged from 18 to 43. Methodological limitations included small sample sizes, the lack of standardised outcome measures and statistical analysis, inadequate reporting of the intervention and results, and the lack of control groups.

- **Exercises** (1 RCT, 33 workers): this RCT found that individualised physical therapy and group exercises both reduced pain, with greater reductions found with individualised therapy.
- **In-house or worksite physical therapy** (1 cohort study, 152 workers): this study found that in-house therapy reduced time lost from work compared with outside therapy. The baseline characteristics of the treatment groups were not compared and there was no description of the outside therapy.
- **Worksite analysis** (1 cohort study, 43 workers): this study found that worksite analysis reduced absence from work in comparison with no worksite analysis, but there was a low (46%) response rate from one of the worksites.
- **Nurse case managers' training on accommodations** (1 RCT, 101 claimants; 1 case series, 53 claimants): both studies suggested that training changed the practice of accommodations, but the data were incomplete and were not analysed statistically.
- **Ergonomic modifications** (2 RCTs, 100 computer users; 1 cohort study, 268 users): both RCTs found that using alternative geometry keyboards may reduce hand pain; the cohort study found that regular breaks may improve recovery, but the outcome measure was not standardised and there was potential for intervention bias.

**Cost information**

One identified cohort study found that in-house therapy was $221 per case cheaper than outside physical therapy ($1,216 for outside versus $995 for in-house).

**Authors' conclusions**

There was insufficient evidence to adequately assess workplace interventions for WRUEDs. Further research is required.

**CRD commentary**

The review question was clear in terms of the intervention and participants. Inclusion criteria were broadly defined in terms of the study design, but were not defined for the outcomes. Several relevant databases were searched but, by limiting the included studies to published reports in English, the authors might have missed some relevant studies. Methods were used to minimise bias in the study selection and validity assessment processes. However, since the methods used to extract the data were not described, it is not known whether any efforts were made to reduce errors and bias.
A narrative synthesis was appropriate given the small number of diverse studies. In synthesising the evidence, the authors took account of study quality. The evidence presented appears to support the authors’ conclusions about the inadequacy of the information and the need for research.

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

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

**Research:** The authors stated that further research of workplace interventions for WRUEDs is required. This should include adequately powered RCTs that use standardised outcomes and appropriate statistical analysis. The authors also stated a need for the following: a survey of current workplace interventions; a set of core outcome measures, to include disability, work limitations, days lost from work, costs and quality of life; testing of the psychometric properties of outcome measures; the development of methods assisting workplaces to conduct trials; and future studies to describe the study design and interventions.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.