Meta-analysis of the effects of psychoeducational care in adults with chronic obstructive pulmonary disease

Devine E C, Pearcy J

Authors' objectives
To examine the effectiveness of psychoeducational care in adults with chronic obstructive pulmonary disease (COPD).

Searching
CINAHL, MEDLINE, Dissertation Abstracts International and PsycLIT were searched with keywords including 'COPD', 'patient/client education', 'counselling', 'behavioural therapy', 'pulmonary rehabilitation' and 'relaxation' therapy'.

Additional material was located by examining dissertations from graduate nursing programmes and University Microfilms International, relevant conference proceedings, and the reference lists of relevant studies and reviews.

Study selection
Study designs of evaluations included in the review
Experimental, quasi-experimental, or pre-post single group study design were included. The studies had to include at least 5 participants in each treatment arm and the treatment groups had to be created from the same setting.

Specific interventions included in the review
The two main interventions were:
1. Pulmonary rehabilitation (both large muscle exercise and education), often in combination with breathing exercises, relaxation, psychosocial support or vocational training.
2. Education (either alone or in combination with behavioural or non-behavioural counselling strategies), typically including didactic content such as, what is COPD, coping with stress, breathing techniques, and use of medications.

Other interventions included guided imagery alone, cognitive counselling and frontalis muscle biofeedback.

Participants included in the review
Adults with obstructive pulmonary disease (COPD, asthma or other chronic pulmonary diseases) were included.

Outcomes assessed in the review
The outcomes assessed included psychological well-being, endurance (e.g. time or distance able to walk, cycle, or use treadmill), changes in oxygen uptake, functional status (e.g. Sickness Impact Profile), dyspnea, pulmonary function (classified as dynamic volume, e.g. forced expiratory volume at 1 second, and static volume, e.g. vital capacity, functional residual capacity and residual volume), knowledge of psychomotor skills, adherence, and utilisation of health care.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
The authors do not report the method used to assess validity, or how the validity assessment was performed. However, information on the manner of assignment of patients to the treatment group and the type of control group was extracted from the studies.
Data extraction
Study type, sample, setting, treatment characteristics and outcomes were extracted. The coding system was developed by the researchers. A random sample of studies was coded twice and inter-rater agreement was calculated.

Methods of synthesis
How were the studies combined?
For each study, the effect size (standardised mean difference between treatment and control groups) was calculated and adjusted for sample size. Average cross-study estimates of effect were calculated for each outcome.

How were differences between studies investigated?
Homogeneity was assessed using a statistic based on the random-effects model.

Results of the review
Sixty-five studies were included (n=3,642).

Random assignment was undertaken in 22 studies, non-random assignment in 13 studies, and 30 studies were of single group, pre-test post-test design.

Analyses by type of treatment showed that pulmonary rehabilitation had statistically-significant beneficial effects on:
- psychological well-being (n=13), mean effect size 0.58 (95% confidence interval, CI: 0.35, 0.81);
- endurance (n=13), mean effect size 0.77 (95% CI: 0.64, 0.90);
- functional status (n=8), mean effect size 0.63 (95% CI: 0.39, 0.88);
- oxygen uptake (n=5), mean effect size 0.56 (95% CI: 0.32, 0.81);
- dyspnea (n=10), mean effect size 0.71 (95% CI: 0.37, 1.04); and
- adherence (n=2), mean effect size 1.76 (95% CI: 1.24, 2.27).

Education-alone had a significant beneficial effect only on the accuracy of performing inhaler skills (n=7), mean effect size 1.27 (95% CI: 0.99, 1.55).

A non significant but small or medium-sized effect of education-alone was evident on health care utilisation and on adherence to treatment regimen.

Relaxation-alone had statistically-significant beneficial effects on both dyspnea, mean effect size 0.91 (95% CI: 0.34, 1.48), and psychological well-being, mean effect size 0.39 (95% CI: 0.08, 0.70).

Authors' conclusions
The research base has identified methodological weaknesses that should be rectified in future research. However, based on the best evidence available, comprehensive pulmonary rehabilitation programmes have been shown to improve multiple measures of functioning and well-being of adults with COPD. The accuracy in performing psychomotor skills (e.g. inhaler use) can be improved through education, and relaxation has been shown to reduce psychological distress and dyspnea.

CRD commentary
The search strategy was thorough, although it is unclear whether the search was restricted to English articles only. The review could have been enhanced with greater details of the primary studies included.
The results of this review should be interpreted with great caution because of poor internal validity of included studies, and the possibility of publication and reporting bias.

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