Autogenic training: a meta-analysis of clinical outcome studies
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Authors' objectives
To determine the effectiveness of autogenic training (AT) compared with other methods of relaxation in clinical populations.

Searching
MEDLINE was searched using the terms 'autogenic training' and 'autogenic relaxation'. The reference lists of three published reviews and three monographs were used to identify additional studies. The search covered 1932 to 1999. Unpublished research was excluded from the review.

Study selection
Study designs of evaluations included in the review
The studies had to have at least one control group or control phase and have at least 5 participants in each treatment or control group. Both randomised trials (RCTs) and non-randomised studies were included. The duration of follow-up varied between the studies.

Specific interventions included in the review
Studies in which therapeutic AT was the only or the main intervention were eligible for inclusion. AT had to be administered so that the participants practised at least some of the exercises without therapeutic guidance. If in a study the role of AT within an extensive therapy plan was not clear that study was excluded. The comparators were pre-post AT, real controls (placebo, waiting-list or basic medical therapy only), medical (non-psychological) treatments, and other psychological treatments. Studies in which both the treatment and control groups received basic medical treatment were included. The duration of AT varied between the studies.

Participants included in the review
Studies of clinically defined patients with a specific disorder, syndrome or symptom were eligible for inclusion. The included studies were grouped under: tension headache and migraine; hypertension; coronary heart disease/secondary prevention of cardiac infarction; asthma; somatoform pain disorder; Raynaud's disease; preparation for childbirth; bowel diseases; epilepsy; fibromyalgia; atopic eczema; infertility; glaucoma; health-related quality of life in cancer; human immunodeficiency virus; anxiety disorders; depression/dysthymia; functional sleep disorders; and alcoholism.

Outcomes assessed in the review
The studies had to evaluate at least one physiological, or behavioural or psychological outcome related to the target clinical disorder. Unspecific effects, such as effects on mood, were also assessed generically.

How were decisions on the relevance of primary studies made?
The authors alluded to independent decisions about inclusion and consensus but did not state explicitly how the papers were selected for the review.

Assessment of study quality
The authors remarked on some aspects of study quality, such as whether randomised or not and sample size, but did not present a systematic assessment of validity.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.
Data were extracted to calculate the difference in the treatment and control group means for the main disease-specific behavioural/psychological and physiological outcomes and for unspecific outcomes in each study. Hedges estimator of the effect size (ES) adjusted for small sample size was calculated for outcomes post-treatment and at follow-up. If data were not reported in the required format, statistical methods were used to convert other reported statistics. Data were estimated from graphs where necessary. If variance data were not available, the variance of a similar population from other studies was used.

**Methods of synthesis**

**How were the studies combined?**

The studies were combined through a meta-analysis of ESs with 95% confidence intervals (CIs). Randomised and non-randomised studies were pooled separately, as were main disease-specific effects and unspecific effects. Within these categories, behavioural/psychological outcomes and physiological outcomes were pooled separately and overall. The studies were weighted by sample size if the results were statistically heterogeneous (P<0.01) in a random-effects analysis, or by the ES variance if the results were homogeneous. An ES of 0.2 to 0.49 was defined as small, 0.5 to 0.79 as medium, and 0.8 or more as large; anything less than 0.2 was interpreted as showing no difference.

The fail-safe N was calculated to estimate how many additional studies with an ES of zero would be needed to reduce the pooled ES to 0.2 or 0.5.

Separate meta-analyses were also conducted for different psychosomatic disorders and different psychological disorders; in each category, RCTs and non-randomised studies were pooled separately and overall.

**How were differences between studies investigated?**

Studies were grouped by the type of comparator. A statistical test for homogeneity was applied in the meta-analyses; a P-value of less than 0.01 indicated statistically significant heterogeneity.

**Results of the review**

Seventy-three studies were summarised of which 60, including 35 RCTs, were included in the meta-analyses.

**Pre-post AT.**

The pooled estimates of the main effects in 33 RCTs (117 individual ESs) were ES 0.68 for both physiological and behavioural/psychological outcomes, and ES 0.75 (95% CI: 0.65, 0.85) overall. The fail-safe N to reduce the pooled ES to 0.2 was 91. For unspecific effects the pooled ES was 0.73. Pooling data from 19 non-randomised studies (61 ESs) showed a small ES (0.36 to 0.43) for the main outcomes; a variable ES (0.25 to 0.81) for unspecific effects was shown in 6 studies.

**AT versus real controls.**

The pooled estimates of the main outcomes in 25 RCTs (88 individual ESs) were ES 0.63 for physiological outcomes and 0.59 for behavioural/psychological outcomes, and ES 0.61 (95% CI: 0.49, 0.74) overall. The fail-safe N to reduce the pooled ES to 0.2 was 49. For unspecific effects the pooled ES was 0.67. Pooling data from 16 non-randomised studies (65 ES) showed a medium ES (0.62 to 0.74) for the main outcomes; a variable ES (0.00 to 1.10) for unspecific effects was shown in 5 studies.

**AT versus other psychological treatments.**

The pooled estimates of the main outcomes in 18 RCTs (62 individual ESs) indicated small effects in favour of other psychological treatments: ES -0.46 for physiological outcomes, ES -0.25 for behavioural/psychological outcomes, and ES -0.28 (95% CI: -0.40, -0.16) overall. There was wide variation in the pooled ES for unspecific effects (ES: -1.23 to 0.38) based on 7 trials. Pooling data from 9 non-randomised studies (42 ESs) showed no effect of AT on the main outcomes; a small ES (0.34) for unspecific effects was shown in 4 studies.

**AT versus medical treatments.**
The pooled estimates of the main outcomes in 4 RCTs showed no effects on physiological or behavioural/psychological outcomes. Pooled data from 3 non-randomised studies showed a large effect on the main behavioural/psychological outcome (ES 0.82), but no effect of AT on physiological outcomes.

The pattern of results for main effects was stable at follow-up for all comparisons. Meta-analyses of RCTs in psychosomatic disorders (31 trials) and psychological disorders (4 trials) showed medium effects of AT on the main outcomes compared with real control conditions, and small effects in favour of other treatments. The full report provided a further breakdown of the results by specific disease.

**Authors’ conclusions**
AT has medium to high effects on the main clinical outcomes in comparison with untreated control conditions and these effects are stable at follow-up. The authors also concluded that AT appears to be similar or less effective than other psychological treatments, and that the results from limited comparisons of AT with medical treatments are inconsistent.

**CRD commentary**
The authors clearly stated the hypotheses that they aimed to test, together with logical inclusion criteria. The search for studies was not extensive and the exclusion of unpublished studies means that some studies, particularly studies with null or negative findings, may have been missed. Steps appear to have been taken to minimise reviewer bias when selecting studies for inclusion. A comment in the 'Discussion' section hinted that foreign language studies were included, but to what extent was unclear. The included studies were not critically appraised to assess how reliable their individual findings might be. The tabulated details of the included studies provided no information on the participants other than the condition treated.

The studies were combined using standard statistical methods, except in the analyses of specific disorders where RCTs were combined with non-randomised studies, which is questionable. Also, more statistical variability between studies than is conventional was tolerated in the pooling; when heterogeneity was detected no attempt was made to explain the differences between the studies. The authors' conclusions reflect an interpretation of pooled data that does not take the actual treatment effects, how reliably they were determined in each individual study, or the variation in findings between the studies, fully into account.

**Implications of the review for practice and research**
Practice: The authors stated that perhaps all relaxation methods should not be considered as stand-alone therapies, especially for severe disorders; for psychosomatic disorders it should be an add-on to medical treatment.

Research: The authors stated that the combination of AT with behavioural and cognitive therapies requires further investigation. In addition, the role of AT as preparation or add-on therapy for people with depression could be investigated in crossover studies.

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Record Status
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.