School programs targeting stress management in children and adolescents: a meta-analysis

CRD summary
This review tentatively concluded that school programmes targeting stress management or coping skills in school children are most likely effective in reducing stress symptoms and enhancing coping skills. The cautiousness of the authors' conclusions appears justified, given reporting limitations and the clear potential for publication bias among the effects observed in the included studies.

Authors' objectives
To evaluate the effect of school programmes targeting stress management or coping skills in school children.

Searching
ERIC, PsycINFO, the Cochrane Library and MEDLINE were searched for relevant studies from January 2003 to January 2006, supplemented with additional searches of the Internet (Google) and manual searches of journals and books. The search terms were reported.

Study selection
Randomised controlled trials (RCTs) or quasi-experimental studies evaluating primary prevention programmes with class educational interventions for children and early adolescents were eligible for inclusion. Primary prevention programmes were defined as interventions designed to promote mental health and reduce the incidence of adjustment problems in currently normal populations. Studies not directly assessing stress but targeting adjustment and coping skills were also eligible. Studies of drug prevention were excluded.

Studies selected for the review evaluated social-emotional training, relaxation programmes, social problem-solving, stress management and combined therapy programmes. The participants ranged in age from kindergarten to 14 years. Control groups received no training, 'placebo', neutral studies or delayed training.

One reviewer selected papers for inclusion, with a second reviewer independently rating eligibility for titles and abstracts that raised questions.

Assessment of study quality
The validity of the included studies was assessed according to the Agency for Healthcare Research and Quality checklist for evaluating RCTs. These included criteria relating to: formulation of study question; description of study population; description of inclusion criteria; number of participants; (quasi) randomisation; investigation of baseline differences; descriptions of intervention, settings and conductor; compliance; description of instrument validation or reliability; blinding of the observers; statistical analysis; consideration of biases and limitations; presentation of follow-up data; and number of measurements reported. To this were added two additional criteria: presenting a theoretical framework and the reporting follow-up data. Studies could score up to a maximum of 16 points.

Two reviewers independently assessed validity, with any disagreements resolved by consensus.

Data extraction
The interventions were categorised as being social-emotional skills, relaxation skills, social problem-solving skills, social-adjustment and social self-management, or combined coping skills. The outcomes were categorised as symptoms of stress, (social) behaviour, coping or self-efficacy.

The mean change from pre-test to post-test on each outcome variable was measured and used to calculate standardised mean difference (SMD) effect sizes with 95% confidence intervals (CIs). Since most studies were relatively small, a correction procedure using Hedges' g was also applied.
Two reviewers independently extracted the data, with any disagreements resolved by consensus.

**Methods of synthesis**
Effect sizes were combined using random-effects meta-analyses. Publication bias was assessed using Egger's unweighted regression asymmetry test. Intervention type and study quality were investigated as sources of heterogeneity using meta-regression analyses and stratification.

**Results of the review**
Nineteen studies (n=4,063) were included in the review.

The quality scores ranged from 8 to 13 points, with a mean of 10.8 (standard deviation 1.41). Compliance, inclusion criteria and blinding were rarely mentioned. Studies of combined interventions had significantly lower average quality scores than did studies of other intervention types (p=0.002).

**Change from baseline.**

The overall effect size for the mean difference in change scores between experimental and control groups was -1.51 (95% CI: -2.29, -0.73). Statistically significant improvements were observed for stress symptoms (14 studies; SMD -0.87, 95% CI: -1.23, -0.50) and coping (12 studies, SMD -3.49, 95% CI: -6.71, -0.28). No significant benefits were observed for (social) behaviour or for self-efficacy. All meta-analyses showed significant heterogeneity (p<0.001).

**Final measures only.**

Overall, statistically significant improvements were observed for behaviour (9 studies; SMD 0.80, 95% CI: 0.57, 1.04) and coping (9 studies; SMD 1.72, 95% CI: 0.75, 2.68). No significant benefit was observed for self-efficacy.

Publication bias was significant for overall effect size (p=0.015) and the outcomes of stress symptoms (p=0.006) and self-efficacy (p=0.046).

**Authors’ conclusions**
Though several issues have to be resolved, school programmes targeting stress management or coping skills are most likely effective in reducing stress symptoms and enhancing coping skills.

**CRD commentary**
This review was reasonably well-conducted. It was based on a question defined in terms of the participants, controls, interventions and study designs. The search covered electronic databases and other sources, though it is not clear whether any language restrictions were applied. If so, there may have been the potential for language bias. The included studies were presented in adequate detail and the validity of each study was assessed according to a published checklist.

In addition, the results of the validity assessment were used to investigate the relationship between study quality and outcomes in the analysis. The methods used to synthesis the included studies appear largely appropriate. Though the presentation of an ‘overall’ effect (including all outcomes) was not particularly useful, the use of SMDs for the different categories of outcomes allowed the results of studies applying different measurement scales for the same underlying outcome to be combined. There were differences between the participants, interventions and outcomes among the studies, so there may be some question of the appropriateness of synthesising these studies. However, the authors tested for statistical heterogeneity and attempted to determine its source where observed; they also investigated publication bias. The authors’ conclusions appear appropriately cautious given the potential for publication bias among the positive effects observed in the included studies.

**Implications of the review for practice and research**
Practice: The authors did not state any implications for practice.

Research: The authors stated several implications for research around the need to reduce methodological variety and variation in outcome measurement among studies of school programmes targeting stress management or coping skills. For example: the need for blinding of observers and/or administrators, the implementation of standardised outcome measures and the use of SMDs to combine studies adopting different measurement scales.
instruments, and the use of longitudinal designs with complete follow-up data.

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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.