CRD summary
The authors concluded that a number of psychosocial interventions were effective in reducing disruptive behaviours among children and adolescents. In view of the limited search, methodological limitations of the review and marked differences between the studies, these conclusions may not be reliable.

Authors’ objectives
To evaluate the effectiveness of psychotherapeutic interventions for disruptive behaviour disorder in children and adolescents.

Searching
PsycINFO was searched for studies published between January 1987 and January 2008. Search terms were reported. Further searches were conducted for additional articles from the authors of eligible studies. Reference lists of relevant literature reviews were handsearched. Researchers involved in two or more of the eligible studies were approached for unpublished material.

Study selection
Studies of children and adolescents aged up to 18 years with disruptive or aggressive behaviour were eligible for inclusion, provided participants met clinical criteria (for example, had a diagnosis of oppositional defiant disorder, conduct disorder or scored above predetermined thresholds on specified clinical assessment tools). Studies were required to report at least one quantitative measure of change in disruptive or aggressive behaviour. Studies were excluded if they: did not identify or describe psychosocial interventions; did not maintain psychopharmacological treatment throughout the study; were conducted in in-patient or residential settings; were single-case studies; or only reported follow-up data. Studies solely of reading interventions were also excluded. Psychosocial treatment was defined as a psychosocial intervention to reduce aggressive, oppositional or maladaptive behaviour or to enhance prosocial behaviour.

The mean age of participants in the included studies ranged from four to 16 years. In about half of the studies, participants had a clinical diagnosis (in most cases oppositional defiant disorder, conduct disorder or attention deficit hyperactivity disorder). Most participants were boys. Treatments used were behavioural therapy, family therapy, cognitive behavioural therapy and psychodynamic therapy; these were delivered by fully trained professionals, therapists in training or trained paraprofessionals. Treatment doses were not consistently reported. A minority of studies replicated model treatment programmes. The review reported the following outcomes: reduction in disruptive or aggressive behaviour (main outcome); teacher-reported aggressive behaviour (in day-care or school setting); social functioning; and parental distress.

Studies were selected for inclusion by the lead author of the review.

Assessment of study quality
Data on the following aspects of study validity were collected: design (randomisation, matching, no randomisation); drop-out rate; sample size; and method of data collection.

The authors did not state clearly how the assessment was performed.

Data extraction
Studies were grouped into those with an untreated (wait list) control and those with a treated control (active control or treatment as usual). An effect size (ES) with 95% confidence interval (CI) was calculated for each study. In studies with a wait list control this was based on the difference in mean change between the groups divided by the pooled standard deviation (SD) of the pre-test score for both groups. In the rest of the studies this was based on the mean change from
baseline within the intervention group, divided by the standard deviation of the pre-test score. If necessary, effect size was calculated from sources such as t-tests, f-tests or p values. Where a study included multiple interventions or reported multiple effect measures, a pooled total effect size was calculated, weighted by the number of participants. Respondent data from mothers were preferred over data from fathers.

For 20% of studies, data were extracted by three coders working independently, with disagreements resolved by discussion. The authors did not state how data were extracted for the other studies.

**Methods of synthesis**

Data were pooled to calculate a pooled effect size and 95% CI, each effect size weighted by the inverse of its variance, using a random-effects model. Weighted regression analysis was conducted to examine the impact of clinical and methodological differences between the studies. Statistical heterogeneity was assessed by the $\chi^2$ test.

**Results of the review**

Sixty five studies were included (4,971 participants): 48 randomised controlled trials (RCTs, 3,328 participants); five matched studies (339 participants); and 12 non-randomised studies (1,304 participants). Drop-out rates appeared to range from 0.8% to 59.1% in the included studies.

**Reduction in disruptive behaviour**

When studies that compared psychosocial treatment versus wait list control were pooled, there was a statistically significant benefit for the intervention group (ES 0.62, 95% CI 0.49 to 0.76; 33 studies). Moderator analysis showed significantly larger effect sizes in studies with small samples.

When studies without untreated controls were pooled, there was a statistically significant benefit associated with the intervention (ES 0.95, 95% CI 0.77 to 1.14; 32 studies).

In both cases, the pooled analysis had significant statistical heterogeneity ($p<0.001$). Moderator analysis showed significantly larger effect sizes in studies with younger children, with behaviour therapy (as opposed to family therapy) and where diagnostic information was reported.

**Other outcomes**

Studies that compared psychosocial treatment versus wait list control showed a significantly larger improvement in the intervention group in teacher-reported aggressive behaviour (ES 0.41, 95% CI 0.30 to 0.52; 20 studies), social functioning (ES 0.42, 95% CI 0.27 to 0.57; 13 studies) and parental distress (ES 0.39, 95% CI 0.23 to 0.57; 16 studies). There was significant heterogeneity for the parental distress outcome ($p<0.01$).

Other results were reported in the review.

**Authors’ conclusions**

A number of psychosocial interventions were effective in reducing disruptive behaviours among children and adolescents.

**CRD commentary**

The objectives of the review were clear, but the inclusion criteria were vague in some respects (for example, the intervention of interest was implied rather than explicit). As only one database was searched, some studies may have been missed. It was unclear whether the search was limited by language. Insufficient steps appeared to have been taken to reduce the risk of reviewer bias and error (such as having more than one reviewer independently undertake study processes). Studies were selected by a single author. It was implied that data extraction was conducted independently by multiple reviewers in only 20% of studies. Some aspects of study validity were reported, but it did not appear that a systematic validity assessment was undertaken. Few details about important aspects of individual studies were presented in the review (such as allocation concealment, duration of follow up). Drop-out rates were not reported clearly but appeared to be over 20% in about one third of the studies. All these factors made it difficult to determine the reliability and applicability of the findings reported. The results of the meta-analysis may be unreliable as different outcomes appeared to have been pooled within studies and different outcomes and interventions were pooled across studies.
without the individual study results being reported. Finally, the marked statistical heterogeneity when all studies were pooled suggested that they may not have been sufficiently similar to pool. The authors acknowledged limitations in the review, including possible publication bias, heterogeneity between the studies and low statistical power for some outcomes. In view of the limited search, methodological limitations of the review and marked differences between the studies, the conclusions may not be reliable.

Implications of the review for practice and research

**Practice:** The authors stated that the choice of a programme to reduce aggressive and disruptive behaviour required caution, with consideration of both treatment effects and possible additional effects.

**Research:** The authors stated that there was a need to develop additional effective outpatient treatments for children with disruptive behaviour, especially adolescents; associated problems also needed to be addressed. The authors noted that more studies of family therapy were needed, as were more studies that replicated model programmes. All primary research studies of treatment effects should include a control condition.

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