The effectiveness of interventions to reduce psychological harm from traumatic events among children and adolescents. A systematic review


CRD summary
The review concluded that individual and group cognitive-behavioural therapy could decrease psychological harm among symptomatic children and adolescents exposed to trauma. Evidence was insufficient to determine the effectiveness of play, art, pharmacological and psychodynamic therapies, and psychological debriefing in reducing psychological harm. The authors' conclusions appeared to be conservative and reflected the evidence, but there were concerns about study quality.

Authors' objectives
To evaluate the effectiveness of interventions commonly used to reduce psychological harm among children and adolescents exposed to traumatic events.

Searching
MEDLINE, EMBASE, ERIC, NTIS, PsycINFO, Social Sciences Abstracts and NCIRS Abstracts were searched from inception to March 2007 for publications in English; some search terms were reported. The bibliography of each retrieved article was handsearched. Experts in the field were contacted for additional relevant studies. Journal articles, government reports and books were included and unpublished studies were not included.

Study selection
Primary studies that evaluated the effectiveness of interventions commonly used to reduce psychological harm among children and adolescents (aged 21 years or less) exposed to traumatic events were eligible for inclusion. Studies needed to be in high-income economies (as defined by the World Bank).

Eligible outcomes included: post-traumatic stress disorder (PTSD: forms of anxiety related to traumatic exposure); other anxiety disorders; depressive disorders; externalising and internalising disorders and symptoms of all the above; suicidal ideation and behaviour; and substance abuse (further details were provided). Other outcomes were reported in the review. Eligible studies had to have a comparison group with no intervention or a delayed or smaller dose of the intervention or (in a single cohort) include a period without exposure, followed by exposure, followed by exposure removal.

The intervention in most of the studies was cognitive-behavioural therapy (CBT), which included eye movement desensitisation and reprocessing. The number of sessions ranged from one to 20 (median for individual CBT was 12 and median for group CBT was eight). Interventions also included other types of therapies: play, art, pharmacological, psychodynamic and psychological debriefing. Some studies included parental involvement. Controls were varied and included no treatment, standard care, supportive therapy, waiting-list and exposure and normalising condition. Mean age of patients ranged from 4.06 to 22 years (age range two to 37 years). Patients were symptomatic in all studies except those of psychological debriefing. Children who were too disruptive or had severe mental health problems were excluded in many studies. All eligible outcomes except substance abuse were addressed in the included studies. Outcomes were measured using various scales and inventories. The most common traumatic event in one third of the included studies was sexual abuse, then domestic violence and other violence. Traumatic events chiefly investigated in individual studies included: suicide of family member and physical abuse; earthquake and volcanic eruption; war and road traffic accidents; and childhood cancer survival, non-abusive physical trauma and burn injury.

It appeared that two independent reviewers performed the study selection, with disagreements resolved by consensus among review team members.

Assessment of study quality
Studies were assessed for study design and this included whether they had a prospective or retrospective design and
whether there were multiple pre- and post-measurements. Study design were given grades, such as greatest and moderate. Penalties were subtracted for poor study execution related to: limitations in population and intervention description; sampling; exposure or outcome measurement; analytic approach; control of confounding; completeness and length of follow-up; and other biases. The number of penalties was used to grade study execution as good (one penalty or less), fair (two to four penalties) and limited (more than four penalties); studies with more than four penalties were excluded.

Two independent reviewers performed the quality assessment. Disagreements were resolved by consensus among review team members.

Data extraction
Where possible, mean scores, sample sizes and variance estimates were extracted for each outcome to calculate standardised mean differences (SMDs, Hedges adjusted g) with 95% confidence intervals (CI). Where insufficient data were available to calculate Hedges adjusted g for an outcome, point estimates of the relative change were calculated.

It appeared that two independent reviewers performed data extraction, with disagreements resolved by consensus among review team members.

Methods of synthesis
Standardised mean differences were pooled using both fixed-effect and random-effects models. Between-study heterogeneity was determined using Q and $I^2$ statistics ($p<0.10$ and $I^2>50\%$ indicated significant heterogeneity). Where data were available, results were stratified by index trauma. Publication bias was assessed for outcomes with sufficient positive data by calculating Rosenthal's fail-safe number.

Results of the review
Thirty studies were identified (n≥2,013, range 10 to 229): 26 prospective studies and four retrospective studies; 28 studies with greatest design and two with moderate design. Sample selection was randomised in 22 studies, which included 13 randomised controlled trials (n≥716, range 10 to 229). Study execution was graded as good in 13 studies and fair in 17 studies. Follow-up was post intervention or between three months and your years.

Individual CBT (11 studies): CBT was statistically significantly effective for PTSD (random-effects SMD -0.34, 95% CI -0.63 to -0.04; six studies, $I^2=1.5\%$) and anxiety (random-effects SMD -0.31, 95% CI -0.51 to -0.10; seven studies, $I^2=0\%$) and not significant for depression (eight studies, $I^2=48.4\%$), externalising behaviour (seven studies, $I^2=68.9\%$) and internalising behaviour (four studies, $I^2=62.4\%$). The effect was larger for trauma other than sexual abuse but only significant for PTSD and greatest with untreated comparison groups (significant for anxiety). Fail-safe N was three studies.

Group CBT (10 studies): CBT was statistically significantly effective for PTSD (random-effects SMD -0.56, 95% CI -0.92 to -0.19; eight studies, $I^2=73.9\%$) and depression (random-effects SMD -0.40, 95% CI -0.58 to -0.23; seven studies, $I^2=0\%$) and not significant for anxiety (four studies, $I^2=60.6\%$). The effect was greater with untreated control groups, where it was significant for PTSD, depression and anxiety. When stratified by trauma type, results were significant for community violence and natural disasters (for depression and PTSD). Fail-safe N was two studies.

Findings for other interventions were based on one or two RCTs and data were insufficient to determine an effect or were inconclusive; there were individual statistically significant outcomes from play, psychodynamic and drug therapy.

Two studies suggested that group CBT had potential for cost effectiveness in treating patients with depression not necessarily related to traumatic events.

Authors' conclusions
There was strong evidence that individual and group cognitive-behavioural therapy can decrease psychological harm among symptomatic children and adolescents exposed to trauma. Evidence was insufficient to determine the effectiveness of play therapy, art therapy, pharmacological therapy, psychodynamic therapy and psychological
debriefing in reducing psychological harm.

**CRD commentary**

The review addressed a well-defined question in terms of participants, interventions and relevant outcomes; relevant study design was less clear. Relevant databases were searched. Only studies published in English were eligible and unpublished studies were not considered; therefore, some relevant studies may have been missed. Publication bias was assessed by calculating the fail-safe number where appropriate. Study quality was assessed, but the suitability of the criteria was not clear. It appeared that efforts were made to reduce error and bias in the review process, but the reporting was not clear. Two studies included patients older than 21 years. The statistical method used for the meta-analysis seemed appropriate. Statistical heterogeneity was assessed and there was evidence for heterogeneity with some outcomes. Where possible, results were stratified by type of trauma and type of control group. There were small numbers of studies for some comparisons. Some studies had quite high drop-out rates. Most studies were pre-post studies. There seemed to be some clinical, methodological and statistical heterogeneity.

The authors’ conclusions appeared to be conservative and reflected the evidence; interpretation of the findings should take into consideration the limitations in the included studies.

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

**Practice:** The authors stated that CBT should be widely taught to appropriate practitioners for response to traumatic events and adapted for use in diverse populations and settings. Parental participation may mediate the effects of CBT on children.

**Research:** The authors recommended well-conducted studies to identify robust predictors of transient and enduring symptoms in children following traumatic events to allow efficient allocation of treatment resources, assess optimal timing of CBT and assess the relationship between severity of symptoms and intensity and length of treatment. Such studies should include long-term follow-up, assess cost effectiveness, assess the effects in minority populations, explore adaptations of CBT for use by non-professionals and undertake studies comparing other interventions with CBT and its applicability to low-income countries. Further research into the effects of interventions with insufficient evidence was needed.

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