Effects of psychotherapeutic treatments for PTSD: a meta-analysis of controlled clinical trials

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Authors' objectives
To assess the effect of psychotherapeutic treatments for post-traumatic stress disorder (PTSD).

Searching
PsycLIT, ERIC, MEDLINE, CINAHL, Dissertation Abstracts, and PILOTS were searched using the following keywords and combinations of keywords: 'posttraumatic stress disorder', 'PTSD', 'therapy', 'treatment', 'outcome' and 'control'. In addition, the reference lists from existing reviews and empirical studies were examined, and twenty-five authors in the field were contacted for unpublished studies.

Study selection
Clinical trials were eligible for inclusion if they used a comparison group and provided inferential statistics for the calculation of effect sizes. The follow-up periods ranged from 3 months to 2 years after the treatment had finished.

Specific interventions included in the review
The inclusion criteria were not defined in terms of interventions. The predominant psychotherapeutic modalities were behavioural and cognitive behavioural interventions. The following interventions were included: direct therapeutic exposure; eye movement desensitisation or reprocessing; biofeedback-assisted desensitisation; a brief prevention programme; applied muscle relaxation; anger treatment; the Coatsville Tx programme; cognitive processing therapy; combat stress reaction; exposure without eye movement; image habituation training; prolonged exposure; the Salem Tx programme; and the Koach programme. In-patient and residential programmes were also included.

The control interventions included: standard treatment, i.e. supportive counselling or no exposure; a waiting-list; and assessment.

Participants included in the review
Only studies that were performed predominately on participants who met the American Psychiatric Association's threshold DSM-III, III-R, or IV criteria for PTSD were eligible for inclusion. Victimised or traumatised people were excluded unless the participants met the criteria for PTSD. The participants included were: Vietnam veterans; Israeli combat veterans; female rape or assault victims; and men and women who were victims of violent crimes, motor vehicle accidents, or who suffered PTSD from the traumatic loss of a loved one.

Outcomes assessed in the review
Five categories of objective measures of outcome were assessed: intrusion, hyperarousal, avoidance, depression and anxiety.

Intrusion included measures from the PTSD Structured Interview, the intrusion scale of the Impact of Event Scale, clinical interview ratings or intrusive experiences, the sleep disturbance subscale of the Modified Vietnam Experiences Questionnaire, and other self-reports of nightmares or flashbacks.

Hyperarousal included self-reports, interviewer ratings, and/or psychological test results of arousal, anxiety, electromyographic activity, heart rate, and skin conductance in response to stressful images; and scores on the arousal subscale of the PTSD Symptom Scale.

Avoidance included interviewer ratings of avoidance, and scores on the avoidance subscales of the PTSD Symptom Scale and Impact of Event Scale.
Depression included scores from the Hamilton Rating Scale for Depression, the Beck Depression Inventory, and the depression subscale of the Symptom Checklist 90-Revised.

Anxiety included scores from the state version of the State-Trait Anxiety Inventory and the anxiety subscale of the Symptom Checklist 90-Revised.

Global personality and trait measures were not assessed.

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

Assessment of study quality
The author does not state that they assessed validity.

Data extraction
The author does not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

The following information was presented in tabular format: author and date of publication; sample size; type of participant; intervention and control treatments; study design and the measures used to calculate effect sizes at post-treatment and follow-up; length of follow-up; and results. Where data were available, the effect sizes (presented as d- and r-values) were calculated at post-treatment and at follow-up. Where effect sizes were not reported, details of the methods used to estimate the effect sizes were given (see Other Publications of Related Interest nos.1 and 2). The effect sizes were averaged across all dependent variables for each study, and a composite effect was calculated for each study.

Methods of synthesis
How were the studies combined?
The average effect sizes for each study were weighted equally then pooled to determine an overall effect and the 95% confidence intervals (CIs) for all studies (see Other Publications of Related Interest no.3).

The dependent measures were categorised according to the target symptoms relevant to the disorder. Effect sizes were calculated for the target symptoms where data were available.

The number of studies required to bring the results to non significance was estimated using the method of Rosenthal (see Other Publications of Related Interest no.4).

How were differences between studies investigated?
Homogeneity was assessed using the Q statistic, and the studies responsible for the heterogeneity were identified.

Results of the review
Seventeen controlled studies (n=690) were included.

Post-treatment. The overall effect size was significant (r=0.26, d=0.54, 95% CI: 0.39, 0.68). The observed heterogeneity (Q=37.24, P<0.05) was due to one study. When this study was removed, the studies were homogeneous (Q=11.94, P=0.96) and the effect was still significant (r=0.25, d=0.52, 95% CI: 0.37, 0.67). Follow-up (12 studies). The effect sizes at the first follow-up period ranged from -0.25 to + 1.69. The overall effect size was significant (r=0.25, d=0.53, 95% CI: 0.37, 0.69). The observed heterogeneity (Q=36.61, P<0.05) was due to one study. When this study was removed, the studies were homogeneous (Q=22.59, P=0.96) and the effect was still significant (r=0.31, d=0.64, 95% CI: 0.47, 0.81). Specific target symptoms. All the effect sizes were significant; these were presented after correction for heterogeneity. Only those effect sizes for hyperarousal symptoms, which were assessed using a variety of measures, showed significant variation: the effect sizes ranged from -1.5 to +8.4. It was estimated that 57 non
significant studies would be required to reduce the overall effect size to one of non significance.

**Authors' conclusions**
Psychotherapeutic treatment reduces PTSD and general psychiatric symptomatology, and these effects are maintained even after the treatment has been terminated. The data support the continued use and investigation of psychotherapeutic modalities for the treatment of PTSD.

**CRD commentary**
The aims were stated, and the inclusion criteria were defined in terms of the study design and the participants. Eligible interventions and outcomes were not defined a priori. Studies were sought from several relevant sources and attempts were made to locate unpublished material. However, the search dates were not reported, it was not stated whether any language restrictions were applied, and the methods used to select the studies were not described. Studies were restricted to those with a comparison group but validity was not assessed. Some relevant information on the primary studies was presented in tabular format, but the methods used to extract the data were not described. In addition, details of the study design did not include the methods by which the patients were allocated to the treatment groups, or the duration of the treatment.

Statistical heterogeneity was assessed and the data were pooled in a meta-analysis without weighting. Studies accounting for the heterogeneity were identified, but no reasons for heterogeneity in overall effect size were postulated. The discussion considered the following limitations of the review: the findings cannot be used as full support for any single treatment; eight studies used a waiting-list, no-treatment control group, rather than a psychological placebo control group; and studies of PTSD sufferers with different aetiologies were combined.

The quality of the evidence on which the results were based cannot be judged, since the validity of the studies was not assessed. The conclusions must, therefore, be interpreted with caution.

**Implications of the review for practice and research**
Practice: The authors state that psychotherapeutic treatment reduces PTSD and general psychiatric symptomatology, and that these effects are maintained even after the treatment has been terminated.

Research: The authors state that more controlled trials are required in the areas of psychological debriefing after trauma, anger management, and the treatment of traumatised children.

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**Other publications of related interest**

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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.