Comparative efficacy of treatments for post-traumatic stress disorder: a meta-analysis
Van Etten M L, Taylor S

Authors' objectives
To assess the efficacy of treatments for post-traumatic stress disorder (PTSD): to identify which classes of treatment are more effective than wait-list controls or placebo, to determine relative efficacy of classes of treatment and to determine whether treatment gains are maintained at follow-up.

Searching
The authors searched the electronic MEDLINE, PILOTS, Psychological Abstracts, and Current Contents databases (1984 to 1996). Conference programmes, recent journal issues, and secondary sources (narrative reviews and book chapters) were also scanned for additional relevant studies and the authors also contacted other PTSD researchers. There were no language restrictions and published and unpublished studies were searched for but it is not clear if these were retrieved.

Study selection
Study designs of evaluations included in the review
Studies of PTSD with five or more participants, where the outcome measures had acceptable levels of validity and reliability as reported in the outcome study or in previous reports, and outcomes were presented in the form of self-reports or observer-related measures for one of more of the variables: intrusions, avoidance, total PTSD severity, depression, and anxiety.

Specific interventions included in the review
Drug therapies including: tricyclic antidepressants (TCAs), agents with anticonvulsant and mood-stabilising properties (e.g. carbamazepine), monoamine oxidase inhibitors (MAIOs), serotonin specific re-uptake inhibitors (SSRIs), and benzodiazepines (BDZs), psychological therapies (behaviour therapy, Eye-Movement Desensitization and Reprocessing (EMDR), relaxation training, hypnotherapy, and dynamic therapy), and control conditions (pill placebo, wait-list controls, supportive psychotherapies, and non- saccade EMDR control).

Participants included in the review
Patients diagnosed with chronic post-traumatic stress disorder (PTSD) according to American Psychiatric Association DSM III, DSM III-R, or DSM-IV criteria, as assessed by structured or unstructured clinical interviews.

Outcomes assessed in the review
Intrusions, avoidance, total PTSD severity, depression, and anxiety. Scores for self-reported intrusions, avoidance and total PTSD symptoms were obtained from the Impact of Event Scale, the Mississippi Scale for Combat-related PTSD, and various DSM-tailored measures such as the PTSD Symptom Checklist, PTSD Index, and Modified PTSD Scale. Self-reported depression was typically assessed by the Beck Depression Inventory and self-reported anxiety was typically assessed by the State-Trait Anxiety Inventory. Scores from other measures were also included in each symptom domain if the alternative measure adequately represented the domain.

Scores for observer-related intrusions, avoidance and total PTSD symptoms were typically obtained from the Clinician Administered PTSD Scale, or from the Structured Interview for PTSD. Observer-rated depression was obtained from the Hamilton Rating Scale for Depression and observer-rated anxiety was typically assessed by the Hamilton Rating Scale for Anxiety.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.
Assessment of study quality
No formal assessment of quality was undertaken.

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

Data were extracted for the categories of trial identification, condition (method of treatment), number of participants completing the study, percentage of drop-outs, trial duration, pre- and post- effect sizes for self-report measures and observer-rated measures used in each trial.

Effect sizes were calculated according to Cohen's d statistic. Effect sizes were based on completer analysis rather than end-point or intention-to-treat analyses.

Methods of synthesis
How were the studies combined?
Pooled effect sizes were calculated with 90% confidence intervals (CIs) and p-values.

How were differences between studies investigated?
The authors do not state how differences between the studies were investigated.

Results of the review
Forty-one studies were located, yielding 61 treatment outcome trials. Thirty-six trials were studies where two or more conditions were compared (parallel group design); 5 trials used cross-over designs; and in the remaining trials the design is not stated. Number of completers = 1029.

Psychological therapies had statistically significantly lower drop-out rates than pharmacotherapies (14% versus 32%), with attrition being uniformly low across all psychological therapies.

In symptom reduction, psychological therapies were more effective than drug therapies, and both were more effective than controls.

Among the drug therapies, SSRIs and carbamazepine had the greatest effect sizes, although the latter was based upon a single trial.

Among the psychological therapies, behaviour therapy and EMDR were most effective, and generally equally so.

The most effective psychological therapies and drug therapies were generally equally effective.

Differences across treatment conditions were generally evident across symptom domains, with little matching of symptom domain to treatment type. However, SSRIs had some advantage over psychological therapies in treating depression.

Follow-up results were not available for most treatments, but available data indicates that treatment effects for behaviour therapy and EMDR are maintained at 15-week follow-up.

For intrusions, drugs effect size was 0.86 (90% CI: 0.63,1.09) for self-report and 1.01 (90% CI: 0.71, 1.31) for observer-rated. Psychological interventions effect size was 1.02 (90% CI: 0.80,1.24) for self-report and 1.57 (90% CI: 1.12, 2.02) for observer-rated. For controls the effect size was 0.49 (90% CI: 0.29, 0.69) for self-report and 0.66 (90% CI: 0.54, 0.78) for observer-rated.

For avoidance, drugs effect size was 0.45 (90% CI: 0.31,0.59) for self-report and 1.00 (90% CI: 0.64, 1.36) for observer-rated. Psychological interventions effect size was 1.03 (90% CI: 0.77, 1.29) for self-report and 1.74 (90% CI:
1.23, 2.25) for observer-rated. For controls the effect size was 0.23 (90% CI: 0.06, 0.46) for self-report and 0.17 (90% CI: -0.18, 0.52) for observer-rated.

For total severity of PTSD symptoms, drugs effect size was 0.69 (90% CI: 0.55, 0.83) for self-report and 1.05 (90% CI: 0.91, 1.19) for observer-rated. Psychological interventions effect size was 1.17 (90% CI: 0.99, 1.35) for self-report and 1.51 (90% CI: 1.17, 1.85) for observer-rated. For controls the effect size was 0.43 (90% CI: 0.33, 0.53) for self-report and 0.77 (90% CI: 0.71, 0.83) for observer-rated.

For anxiety, drugs effect size was 0.61 (90% CI: 0.39,0.83) for self-report and 0.64 (90% CI: 0.61, 1.09) for observer-rated. Psychological interventions effect size was 1.04 (90% CI: 0.89, 1.19) for self-report and not reported for observer-rated. For controls the effect size was 0.17 (90% CI: 0.06, 0.28) for self-report and not reported for observer-rated.

For depression, drugs effect size was 0.65 (90% CI: 0.39,0.91) for self-report and 0.72 (90% CI: 0.55, 0.89) for observer-rated. Psychological interventions effect size was 1.00 (90% CI: 0.87, 1.13) for self-report and not reported for observer-rated. For controls the effect size was 0.23 (90% CI: 0.16, 0.30) for self-report and 0.36 (90% CI: 0.19, 0.53) for observer-rated.

Effect sizes at follow up (15 weeks) were:

1. For intrusions self-report M = 1.56 (90% CI: 0.81, 2.29) for behavioural interventions and M = 1.75 (90% CI: 1.46, 2.04) for EMDR.

2. For intrusions observer-rated M = 1.47 (90% CI: 0.60, 2.34) for behavioural interventions and M = 2.07 (90% CI: 1.77, 2.37) for EMDR.

3. For avoidance self-report M = 1.44 (90% CI: 0.47, 2.41) for behavioural interventions and M = 1.89 (90% CI: 1.08, 2.70) for EMDR.

4. For avoidance observer-rated M = 1.32 (90% CI: 0.71, 1.93) for behavioural interventions and M = 2.34 (90% CI: 1.76, 2.92) for EMDR.

5. For total severity of PTSD symptoms self-report M = 1.63 (90% CI: 1.10, 2.16) for behavioural interventions and M = 1.33 (90% CI: 0.89, 1.77) for EMDR.

6. For total severity of PTSD symptoms observer-rated M = 1.93 (90% CI: 1.67, 2.19) for behavioural interventions and M = 2.27 (90% CI: 1.78, 2.76) for EMDR.

7. For anxiety self-report M = 0.99 (90% CI: 0.66, 1.32) for behavioural interventions and M = 0.90 (90% CI: 0.64, 1.16) for EMDR (with no data on anxiety observer-rated reported).

8. For depression self-report M = 0.93 (90% CI: 0.76, 1.10) for behavioural interventions and M = 0.91 (90% CI: 0.46, 1.36) for EMDR (with no data on depression observer-rated reported).

**Authors’ conclusions**

The authors state that this meta-analysis provides new information about the relative efficacy of treatments for PTSD. The results support the use of behaviour therapy, EMDR, and SSRIs. It remains to be seen whether the efficacy of treatment can be improved by using these interventions in combination.

**CRD commentary**

The authors have clearly stated their research question and their inclusion and exclusion criteria. The literature search is very good and the authors have not restricted their searches by language or publication status.

The quality of the included studies was not formally assessed and the authors have not reported on how the articles were
selected, or how many of the reviewers were involved in the data selection and extraction. Any differences in study design are not noted.

The data extraction is reported in tables and text and the statistical pooling was appropriate but no tests for heterogeneity were made.

The authors have discussed the limitations of their review which include the use of effect sizes which may not be comparable across the included studies, the relatively small number of trials included and the use of a less-rigorous confidence interval (90% instead of 95%). The authors conclusions appear to follow from the results but should be viewed with caution because of the methodological limitations of the review.

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

Practice: The authors state that their results support the use of behaviour therapy, EMDR, and SSRIs.

Research: The authors state that future research is needed to test whether combined BZD therapy with psychological therapy is less effective than psychological therapy alone. Research is also needed on combined psychological therapies versus individual psychological therapies, and the comparability of treatment efficacy in subclinical PTSD and full PTSD in children. More research trials on PTSD treatment outcome would likely increase the power of the meta-analysis and would also permit more fine-grained analysis.

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