TECHNICAL COMMENTARY

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POST-TRAUMATIC STRESS DISORDER LIBRARY

All therapies for the prevention of PTSD

Introduction

Early intervention models suggest psychological interventions given to any individual exposed to a traumatic event may prevent the onset of trauma-related symptoms and the development of PTSD.

Cognitive behavioural therapy (CBT) is one of the most common psychological treatments that are effective for the treatment of PTSD. CBT challenges distorted, negative thinking patterns associated with the trauma to help people develop more adaptive cognitions and behaviours, and to rethink assumptions and reactions to the event. Exposure therapies are also frequently recommended. These aim to desensitise people to trauma-related memories and to help people overcome symptoms by exposing them to specific or non-specific cues or memories related to the trauma. Eye movement desensitisation and reprocessing (EMDR) may also be effective. EMDR involves the patient focussing on a disturbing image, memory, emotion, or cognition associated with the trauma while the therapist initiates rapid voluntary eye movements. This is based on the observation that the intensity of traumatic memories can be reduced through eye movements, although the mechanisms remain unclear.

Other therapies include narrative therapy, which can be used to help people reconstruct a consistent narrative about the trauma. Psychoeducation may help normalise stress reactions. Psychodynamic therapy can help people process the trauma emotionally and gain a better understanding of their responses to it. Supportive therapy involves counsellors giving support, listening, and helping people talk over their problems, while family therapy focusses on improving family communication and functioning.

Method

We have included only systematic reviews (systematic literature search, detailed methodology with inclusion/exclusion criteria) published in full text, in English, from the year 2010 that report results separately for people with PTSD. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. When multiple copies of review topics were found, only the most recent and comprehensive version was included. We prioritised reviews with pooled data for inclusion.

Review reporting assessment was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist that describes a preferred way to present a meta-analysis[1]. Reviews with less than 50% of items checked have been excluded from the library. Note that early reviews may have been guided by less stringent reporting checklists than the PRISMA, and that some reviews may have been limited by journal guidelines.

Evidence was graded using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group approach where high quality evidence such as that gained from randomised controlled trials (RCTs) may be downgraded to moderate or low if review and study quality is limited, if there is inconsistency in results, indirect comparisons, imprecise or sparse data and high probability of reporting bias. It may also be downgraded if risks associated with the intervention or other matter under review are high. Conversely, low quality evidence such as that gained from observational studies may be upgraded if effect sizes are large or if there is a dose dependent response. We have also taken into account sample size and whether results are consistent, precise and direct with low associated risks (see end of table for an explanation of these terms)[2]. The resulting table represents an objective summary of the available evidence, although the conclusions are solely the opinion of staff of NeuRA (Neuroscience Research Australia).

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Results

We found three systematic reviews that met our inclusion criteria[3-5].

- Moderate quality evidence found a medium-sized reduction in rates of PTSD diagnosis, and more improvement in PTSD symptoms, for up to one month following psychological therapy (mostly CBT) in children and adolescents exposed to trauma when compared to usual care. However, these effects were not significant over the longer term. Direct comparisons between interventions showed no differences in rates of PTSD diagnosis in children receiving CBT, EMDR, or supportive therapy, although CBT was better than EMDR, play therapy, and supportive therapy for PTSD symptom improvement.
- Moderate quality evidence found a small reduction in PTSD diagnoses in adults exposed to trauma by 3-6 months following multiple session early psychological interventions compared to usual care. However, there were no differences immediately post-treatment or at 7-12 months. There were also no differences in PTSD symptom severity, depression, anxiety, or quality of life. Authors report a high risk of bias in the included trials.

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Gillies D, Maiocchi L, Bhandari AP, Taylor F, Gray C, O'Brien L

Psychological therapies for children and adolescents exposed to trauma

Cochrane Database of Systematic Reviews 2016; 10: CD012371

View review abstract online

Comparison	**Effectiveness of psychological therapies (mostly CBT, also family therapy, debriefing, EMDR, narrative therapy, psychoeducation, and supportive therapy) vs. treatment as usual, waitlist, or no treatment for the prevention of PTSD in children and adolescents.**
Summary of evidence	**Moderate quality evidence (large samples, some inconsistency, precise, indirect) found a medium-sized reduction in rates of PTSD diagnosis, and more improvement in PTSD symptoms with psychological therapy (mostly CBT) than treatment as usual, waitlist, or no treatment. Authors report confidence in these findings is limited by the quality of the included studies.**

PTSD diagnosis

A medium-sized effect showed the rate of being diagnosed with PTSD was reduced with psychological therapy;

≤1 month: 5 RCTs, N = 874, OR = 0.51, 95%CI 0.34 to 0.77, $p = 0.0014$, $I^2 = 22\%$

PTSD symptoms were also significantly reduced;

≤1 month: 15 RCTs, N = 2,051, SMD = -0.42, 95%CI -0.61 to -0.24, $p < 0.00001$, $I^2 = 71\%$

These effects were not significant over the longer term.

Direct comparisons showed no differences in rates of PTSD diagnosis between CBT, EMDR, and supportive therapy, although CBT was better than EMDR, play therapy, and supportive therapies for PTSD symptom improvement.

Consistency in results‡	Consistent for diagnosis, inconsistent for symptoms.
Precision in results§	Precise
Directness of results‖	Indirect; mixed treatment and control conditions

Papola D, Purgato M, Gastaldon C, Bovo C, van Ommeren M, Barbui C, Tol WA

Psychological and social interventions for the prevention of mental disorders in people living in low- and middle-income countries affected by

humanitarian crises

Cochrane Database Systematic Reviews 2020; 9: Cd012417

View review abstract online

Comparison	**Effectiveness of psychological therapies vs. waitlist control for the prevention of PTSD in people exposed to humanitarian crises. People with a diagnosis of PTSD were excluded from the review.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, precise, indirect) found no benefit of psychological interventions for improving non-clinical PTSD symptoms in people exposed to humanitarian crises in low- and middle-income countries.**
PTSD diagnosis	
There were no differences between groups in PTSD symptoms in children and adolescents; 3 RCTs, N = 590, SMD = -0.16, 95%CI -0.50 to 0.18, $p > 0.05$, $I^2 = 81\%$ There were also no differences in depression or anxiety symptoms in children or adults. No data were available for PTSD symptoms in the adult population. None of the included studies provided data on the efficacy of interventions to prevent the onset of PTSD (rates).	
Risks	There were no differences in drop-out rates.
Consistency in results	Inconsistent
Precision in results	Precise
Directness of results	Indirect; mixed treatment conditions

Roberts NP, Kitchiner NJ, Kenardy J, Robertson L, Lewis C, Bisson JI

Multiple session early psychological interventions for the prevention of post-traumatic stress disorder

Cochrane Database of Systematic Reviews 2019; 8: CD006869

View review abstract online

Comparison	**Effectiveness of multiple session early psychological intervention therapies (various) vs. treatment as usual for the prevention of PTSD in adults.**
Summary of evidence	**Moderate quality evidence (large samples, consistent, imprecise, indirect) found a small reduction in PTSD diagnoses**

	at 3-6 months with multiple session early psychological interventions compared to usual care. There were no differences immediately post-treatment or at 7-12 months. There were also no differences in PTSD symptom severity, depression, anxiety or quality of life. Authors report a high risk of bias in the included trials.
PTSD diagnosis	
A small effect showed multiple session early psychological interventions may be more effective than usual care in reducing PTSD diagnosis at 3-6 months; 5 RCTs, N = 758, RR = 0.62, 95%CI 0.41 to 0.93, $p < 0.05$, $I^2 = 34\%$ *There was no significant difference in PTSD diagnosis post-treatment or at 7-12 months;* Post-treatment: 5 RCTs, N = 556, RR = 1.06, 95%CI 0.85 to 1.32, $p > 0.05$, $I^2 = 0\%$ 7-12 months: 5 RCT, N = 132, RR = 0.94, 95%CI 0.20 to 4.49, $p > 0.05$ There were no differences in PTSD severity, depression, anxiety, or quality of life.	
Risks	There were no differences in drop-out rates for any reason.
Consistency in results	Consistent
Precision in results	Imprecise
Directness of results	Indirect; mixed treatment and/or control conditions

Explanation of acronyms

CBT = cognitive behavioural therapy, CI = confidence interval, EMDR = eye movement desensitisation and reprocessing, I^2 = the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance), OR = odds ratio, N = number of participants, RR = risk ratio, SMD = standardised mean difference, *p* = statistical probability of obtaining that result, vs. = versus

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Explanation of technical terms

* Bias has the potential to affect reviews of both RCT and observational studies. Forms of bias include; reporting bias – selective reporting of results; publication bias - trials that are not formally published tend to show less effect than published trials, further if there are statistically significant differences between groups in a trial, these trial results tend to get published before those of trials without significant differences; language bias – only including English language reports; funding bias - source of funding for the primary research with selective reporting of results within primary studies; outcome variable selection bias; database bias - including reports from some databases and not others; citation bias - preferential citation of authors. Trials can also be subject to bias when evaluators are not blind to treatment condition and selection bias of participants if trial samples are small[6].

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† Different effect measures are reported by different reviews.

Prevalence refers to how many existing cases there are at a particular point in time. Incidence refers to how many new cases there are per population in a specified time period. Incidence is usually reported as the number of new cases per 100,000 people per year. Alternatively some studies present the number of new cases that have accumulated over several years against a person-years denominator. This denominator is the sum of individual units of time that the persons in the population are at risk of becoming a case. It takes into account the size of the underlying population sample and its age structure over the duration of observation.

Reliability and validity refers to how accurate the instrument is. Sensitivity is the proportion of actual positives that are correctly identified (100% sensitivity = correct identification of all actual positives) and specificity is the proportion of negatives that are correctly identified (100% specificity = not identifying anyone as positive if they are truly not).

Weighted mean difference scores refer to mean differences between treatment and comparison groups after treatment (or occasionally pre to post treatment) and in a randomised trial there is an assumption that both groups are comparable on this measure prior to treatment. Standardised mean differences are divided by the pooled standard deviation (or the standard deviation of one group when groups are homogenous) that allows results from different scales to be combined and compared. Each study's mean difference is then given a weighting depending on the size of the sample and the variability in the data. Less than 0.4 represents a small effect, around 0.5 a medium effect, and over 0.8 represents a large effect[6].

Odds ratio (OR) or relative risk (RR) refers to the probability of a reduction (< 1) or an increase (> 1) in a particular outcome in a treatment group, or a group exposed to a risk factor, relative to the comparison group. For example, a RR of 0.75 translates to a reduction in risk of an outcome of 25% relative to those not receiving the treatment or not exposed to the risk factor. Conversely, a RR of 1.25 translates to an increased risk of 25% relative to those not receiving treatment or not having been exposed to a risk factor. A RR or OR of 1.00 means there is no difference between groups. A medium effect is considered if RR > 2 or < 0.5 and a large effect if RR > 5 or < 0.2[7]. lnOR stands for logarithmic OR where a lnOR of 0 shows no difference between groups. Hazard ratios measure the effect of an explanatory variable on the hazard or risk of an event.

Correlation coefficients (eg, r) indicate the strength of association or relationship

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between variables. They can provide an indirect indication of prediction, but do not confirm causality due to possible and often unforseen confounding variables. An r of 0.10 represents a weak association, 0.25 a medium association and 0.40 and over represents a strong association. Unstandardised (*b*) regression coefficients indicate the average change in the dependent variable associated with a 1 unit change in the independent variable, statistically controlling for the other independent variables. Standardised regression coefficients represent the change being in units of standard deviations to allow comparison across different scales.

‡ Inconsistency refers to differing estimates of effect across studies (i.e. heterogeneity or variability in results) that is not explained by subgroup analyses and therefore reduces confidence in the effect estimate. I^2 is the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance) - 0% to 40%: heterogeneity might not be important, 30% to 60%: may represent moderate heterogeneity, 50% to 90%: may represent considerable heterogeneity and over this is considerable heterogeneity. I^2 can be calculated from Q (chi-square) for the test of heterogeneity with the following formula[6];

$$I^2 = \left(\frac{Q - df}{Q}\right) \times 100\%$$

§ Imprecision refers to wide confidence intervals indicating a lack of confidence in the effect estimate. Based on GRADE recommendations, a result for continuous data (standardised mean differences, not weighted mean differences) is considered imprecise if the upper or lower confidence limit crosses an effect size of 0.5 in either direction, and for binary and correlation data, an effect size of 0.25. GRADE also recommends downgrading the evidence when sample size is smaller than 300 (for binary data) and 400 (for continuous data), although for some topics, these criteria should be relaxed[8].

‖ Indirectness of comparison occurs when a comparison of intervention A versus B is not available but A was compared with C and B was compared with C that allows indirect comparisons of the magnitude of effect of A versus B. Indirectness of population, comparator and/or outcome can also occur when the available evidence regarding a particular population, intervention, comparator, or outcome is not available and is therefore inferred from available evidence. These inferred treatment effect sizes are of lower quality than those gained from head-to-head comparisons of A and B.

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