TECHNICAL COMMENTARY

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POST-TRAUMATIC STRESS DISORDER LIBRARY

Time post-trauma

Introduction

For a person to be diagnosed with PTSD, at least one stressor is required. Stressors as determined by the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) include being exposed to threatened death, actual or threatened serious injury, or actual or threatened sexual violence. Examples are direct exposure, witnessing the trauma, or learning that a relative or close friend was exposed to trauma.

This summary table presents the evidence for risk of PTSD at different time intervals post-trauma exposure.

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 reviews were found, only the most recent 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).

Results

We found 13 systematic reviews that met our inclusion criteria[3-15].

- Moderate quality evidence found the prevalence of PTSD symptoms in patients with a coronavirus infection was around 29%. Rates were highest when measured after outbreaks in patients and the general public, while healthcare workers showed higher rates of PTSD during rather than after outbreaks.
- Moderate quality evidence found the overall prevalence of PTSD in child and adolescent asylum seekers and refugees was around 23%. Prevalence was higher for those displaced for less than two years than for those displaced for over two years.
- Moderate quality evidence found the incidence of PTSD after a flood was around 16%. The incidence is highest in people who experience severe flood intensity and highest within six months after the flood.
- Moderate quality evidence found the incidence of PTSD after an earthquake was around 24%. The incidence is highest within nine months after the earthquake.

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- Moderate to high quality evidence found a medium-sized effect of increased PTSD symptoms in healthcare workers exposed to critical incidents compared to healthcare workers not exposed to critical incidents. The effect was larger after four weeks post-incident than before four weeks post-incident.
- Moderate quality evidence found small to medium-sized associations between exposure to disasters and PTSD symptoms in youth ≤18 years. The associations were strongest measured at 6-12 months than at <6 months or over 12 months post-disaster.
- Moderate to high quality evidence found a small association between less time after exposure to any trauma in children and adolescents and increased risk of PTSD.
- High quality evidence found a small association between less PTSD symptoms and more time since spinal cord injury.
- Moderate to high quality evidence found a large effect of more PTSD symptoms in parents of chronically ill children than in parents of healthy children. Rates were lowest in parents of children with longer time since active treatment.
- Moderate quality evidence found a medium-sized effect of fewer PTSD symptoms in older adults than younger adults following exposure to man-made disasters. The effect was larger up to 6 months after the disaster than over 6 months after the disaster, and in those who had the greatest level of exposure.
- Moderate to high quality evidence found the prevalence of PTSD in people with cancer was around 11%. Rates of PTSD were higher in studies of people with a longer time since cancer diagnosis.
- Moderate to high quality evidence found a small association between greater level of exposure to mass shootings (closer proximity, longer duration) and increased PTSD symptoms. There were no moderating effects of time since shooting.
- Moderate quality evidence found the prevalence of PTSD in people after a road traffic accident was around 22.25%. There were no significant differences in prevalence rates according to time at PTSD measurement.

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Blackmore R, Gray KM, Boyle JA, Fazel M, Ranasinha S, Fitzgerald G, Misso M, Gibson-Helm M

Systematic Review and Meta-Analysis: The Prevalence of Mental Illness in Child and Adolescent Refugees and Asylum Seekers

Journal of the American Academy of Child and Adolescent Psychiatry 2020; 59(6): 705-714

View review abstract online

Comparison	**PTSD in child and adolescent refugees and asylum seekers.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, appears imprecise, direct) finds the overall prevalence of PTSD in child and adolescent asylum seekers and refugees is around 23%. Prevalence was higher for those displaced for less than 2 years than for over 2 years (35% vs. 21%).**
Refugees and asylum seekers	
7 studies, N = 681, overall prevalence = 22.71%, 95%CI 12.79% to 32.64%, I^2 = 91% Prevalence was higher for those displaced for less than 2 years than over 2 years (35% vs. 21%).	
Consistency in results‡	Inconsistent
Precision in results§	Appears imprecise
Directness of results‖	Direct

Chen L, Liu A

The Incidence of Posttraumatic Stress Disorder After Floods: A Meta-Analysis

Disaster Medicine and Public Health Preparedness 2015; 9: 329-33

View review abstract online

Comparison	**PTSD after floods.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, imprecise, direct) finds the incidence of PTSD after a flood is around 16%. The incidence is highest in people who experience severe flood intensity and highest within six months after the flood.**

Floods	
14 studies, N = 40,600, incidence = 15.74%, 95%CI 11.25% to 20.82%, Q*p* < 0.001 The incidence of PTSD was higher in people who experienced severe or moderate flood intensity than in people who experienced mild flood intensity (20.06% vs. 12.82% vs. 4.41%). The incidence of PTSD was higher within the six months after the flood than after six months after the flood (18.44% vs. 9.78%).	
Consistency in results	Inconsistent
Precision in results	Appears imprecise
Directness of results	Direct

Dai W, Chen L, Lai Z, Li Y, Wang J, Liu A

The incidence of post-traumatic stress disorder among survivors after earthquakes: a systematic review and meta-analysis

BMC Psychiatry 2016; 16: 188

View review abstract online

Comparison	**PTSD after earthquakes.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, imprecise, direct) finds the incidence of PTSD after an earthquake is around 24%. The incidence is highest within nine months after the earthquake.**
Earthquakes	
46 studies, N = 76,101, incidence = 23.66%, 95%CI 19.34% to 28.27%, I^2 = 99.5%, The subgroup analyses showed that the incidence of PTSD after earthquake varied significantly across studies in relation to the time of PTSD assessment (<9 months = 28.76% vs. >9 months = 19.48%).	
Consistency in results	Inconsistent
Precision in results	Appears imprecise
Directness of results	Direct

de Boer J, Lok A, Van't Verlaat E, Duivenvoorden HJ, Bakker AB, Smit BJ

Work-related critical incidents in hospital-based health care providers and the risk of post-traumatic stress symptoms, anxiety, and depression: a meta-analysis

Social Science and Medicine 2011; 73: 316-26

View review abstract online

Comparison	**PTSD after exposure to work-related hospital critical incidents.** **Most critical incidents comprised treating SARS patients. Others concerned treating victims of terror or treating patients in critical care units.**
Summary of evidence	**Moderate to high quality evidence (large sample, inconsistent, precise, direct) found a medium-sized effect of increased PTSD symptoms in health workers exposed to critical incidents compared to health workers not exposed to critical incidents. The effect was larger after 4 weeks post-incident than before 4 weeks post-incident.**

Secondary workplace trauma

A medium-sized effect showed increased PTSD symptoms in people exposed to critical incidents;

11 studies, N = 3,866, SMD = 0.32, 95%CI 0.12 to 0.50, $p < 0.05$, $I^2 = 82\%$

The pooled effect size was smaller in the subgroup analysis of studies measuring PTSD during the first four weeks of the incident compared to studies measuring PTSD between four and 26 months after the incident (SMD = 0.20 vs. 0.52).

Consistency in results	Inconsistent
Precision in results	Precise
Directness of results	Direct

Furr JM, Comer JS, Edmunds JM, Kendall PC

Disasters and youth: a meta-analytic examination of posttraumatic stress

Journal of Consulting and Clinical Psychology 2010; 78: 765-80

View review abstract online

Comparison	**PTSD symptoms in youth (≤18 years) after disasters.**
Summary of evidence	**Moderate quality evidence (large sample, direct) found small to medium-sized associations between exposure to disasters and**

	PTSD symptoms in youth ≤18 years. The associations were strongest measured at 6-12 months than at <6 months or over 12 months.
Disasters	
96 studies, N = 74,154 *Small to medium-sized associations between exposure to disasters and PTSD symptoms;* All symptoms: 42 studies, $r = 0.19$, $p < 0.0001$ Reexperiencing: 12 studies, $r = 0.14$, $p < 0.01$ Avoidance: 15 studies, $r = 0.12$, $p < 0.05$ Hyperarousal: 12 studies, $r = 0.12$, $p < 0.10$ PTSD measured at 6-12 months showed stronger associations than PTSD measured at <6 months or >12 months.	
Consistency in results	No measure of between study heterogeneity was reported (only between effect sizes).
Precision in results	No CIs are reported
Directness of results	Direct

Lin W, Gong L, Xia M, Dai W

Prevalence of posttraumatic stress disorder among road traffic accident survivors: A PRISMA-compliant meta-analysis

Medicine 2018; 97: e9693

View review abstract online

Comparison	**PTSD in people after road traffic accidents.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, imprecise, direct) finds the overall prevalence of PTSD in people after a road traffic accident is around 22.25%. There were no significant differences in prevalence rates according to time at PTSD measurement (<1 year = 17.33%, at 1 year = 18.14%).**
Road traffic accidents	
15 studies, N = 6,804, overall prevalence = 22.25%, 95%CI 16.71% to 28.33%, $I^2 = 97\%$ There were no significant differences in prevalence rates according to time at PTSD measurement (<1 year = 17.33%, at 1 year = 18.14%).	

Consistency in results	Inconsistent
Precision in results	Appears imprecise
Directness of results	Direct

Pinquart M

Posttraumatic Stress Symptoms and Disorders in Parents of Children and Adolescents With Chronic Physical Illnesses: A Meta-Analysis

Journal of Traumatic Stress 2019; 32: 88-96

View review abstract online

Comparison	**PTSD in parents of children with a chronic physical illness (cancer, burns, heart disease, diabetes, epilepsy, and asthma) vs. community norms or parents of healthy children.**
Summary of evidence	**Moderate to high quality evidence (large sample, consistent, imprecise, direct) found a large effect of more PTSD symptoms in parents of chronically ill children than in parents of healthy children. Rates were lowest in parents of children with longer time since active treatment.**
Parents of children with chronic physical illness	
184 studies, N = 30,068 *A large effect of more PTSD symptoms in parents of chronically ill children than in parents of healthy children;* OR = 7.12, 95%CI 6.01 to 8.44, $p < 0.001$, Qp = 0.151 Longer time since active treatment was associated with lower parental PTSD symptoms.	
Consistency in results	Consistent
Precision in results	Imprecise
Directness of results	Direct

Pollock K, Dorstyn D, Butt L, Prentice S

Posttraumatic stress following spinal cord injury: a systematic review of risk and vulnerability factors

Spinal Cord 2017; 55: 800-11 View review abstract online	
Comparison	**Risk factors associated with PTSD following spinal cord injury.**
Summary of evidence	**High quality evidence (large samples, mostly consistent, precise, direct) found a small association between more PTSD symptoms and less time since spinal cord injury.**
Spinal cord injury	
A small association was found between more PTSD symptoms and less time since trauma; 7 studies, N = 716, r = -0.12, 95%CI -0.19 to -0.05, $p < 0.001$, I^2 = 29%	
Consistency in results	Consistent
Precision in results	Precise
Directness of results	Direct

Salehi M, Amanat M, Mohammadi M, Salmanian M, Rezaei N, Saghazadeh A, Garakani A

The prevalence of post-traumatic stress disorder related symptoms in Coronavirus outbreaks: A systematic-review and meta-analysis

Journal of Affective Disorders 2021; 282: 527-38

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Comparison	**PTSD symptoms in patients following or during a coronavirus infection (severe acute respiratory syndrome [SARS], Middle East respiratory syndrome [MERS], and Coronavirus disease 2019 [COVID-19]).**
Summary of evidence	**Moderate quality evidence (large samples, inconsistent, appears imprecise, direct) finds the prevalence of PTSD symptoms in patients with a coronavirus infection is around 29%. Rates were highest when measured after outbreaks in patients and the general public, while healthcare workers showed higher rates of PTSD during outbreaks.**
Coronavirus outbreaks	
Overall 35 studies, N = not reported, prevalence rate = 18%, 95%CI 15% to 20%, I^2 = 98%	

Prevalence rates were higher after outbreaks (23%) than during outbreaks (14%). General population samples 12 studies, N = 13,006, prevalence rate = 12%, 95%CI 8% to 16%, I^2 = 98% Prevalence rates were higher after outbreaks (18%) than during outbreaks (11%). Patients 10 studies, N = 794, prevalence rate = 29%, 95%CI 18% to 39%, I^2 = 96% Prevalence rates were higher after outbreaks (37%) than during outbreaks (2%). Healthcare workers 15 studies, N = 5,628, prevalence rate = 18%, 95%CI 13% to 24%, I^2 = 97% Prevalence rates were higher during outbreaks (23%) than after outbreaks (13%).	
Consistency in results	Inconsistent
Precision in results	Appears imprecise
Directness of results	Direct

Siskind DJ, Sawyer E, Lee I, Lie DC, Martin-Khan M, Farrington J, Crompton D, Kisely S

The mental health of older persons after human-induced disasters: A systematic review and meta-analysis of epidemiological data

American Journal of Geriatric Psychiatry 2016; 24: 379-88

View review abstract online

Comparison	**PTSD symptoms in older adults vs. younger adults (>60 years) after human-induced disasters.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, imprecise, direct) found a medium-sized effect of fewer PTSD symptoms in older adults than younger adults following exposure to man-made disasters. The effect was larger up to 6 months after the disaster than over 6 months after the disaster, and in those who had the greatest level of exposure.**
Human-induced disasters	
A medium-sized effect of fewer PTSD symptoms in older adults; 7 studies, N = 23,924, OR = 2.85, 95%CI 1.42 to 5.70, *p* = 0.003, I^2 = 89% The effect was larger up to 6 months after the disaster than over 6 months after the disaster (OR =	

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3.13 vs. 2.23), and in those who had the greatest exposure (OR = 3.70).	
Consistency in results	Inconsistent
Precision in results	Imprecise
Directness of results	Direct

Swartzman S, Booth JN, Munro A, Sani F

Posttraumatic stress disorder after cancer diagnosis in adults: A meta-analysis

Depression and Anxiety 2017; 34: 327-39

View review abstract online

Comparison	**PTSD in people with cancer vs. matched controls.**
Summary of evidence	**Moderate to high quality evidence (large overall sample, consistent, imprecise, direct) found the prevalence of PTSD in people with cancer was around 11%. This represents a small increase in the risk of PTSD in people with cancer compared to people without cancer. Rates of PTSD were higher in studies of people with a longer time since cancer diagnosis.**
Cancer	
110 studies, N = 16,755, prevalence of PTSD = 10.8% *A small effect of increased rates of PTSD in people with cancer compared to controls;* 11 studies, OR = 1.66, 95%CI 1.09 to 2.53, I^2 = 17% Rates of PTSD were higher in studies of people with a longer time since cancer diagnosis.	
Consistency in results	Consistent
Precision in results	Imprecise
Directness of results	Direct

Trickey D, Siddaway AP, Meiser-Stedman R, Serpell L, Field AP

A meta-analysis of risk factors for post-traumatic stress disorder in children and adolescents

Clinical Psychology Review 2012; 32: 122-38 View review abstract online	
Comparison	**Risk of PTSD in children and adolescents.**
Summary of evidence	**Moderate to high quality evidence (unclear sample size, consistent, precise, direct) found a small association between less time after exposure to any trauma in children and adolescents and increased risk of PTSD.**
Any trauma exposure	
A small association was found between less time post-trauma and increased risk of PTSD; 9 studies, N not reported, r = -0.18, 95%CI -0.34 to -0.03, $p < 0.05$, Q$p > 0.05$	
Consistency in results	Consistent
Precision in results	Precise
Directness of results	Direct

Wilson LC

Mass shootings: a meta-analysis of the dose-response relationship

Journal of Traumatic Stress 2014; 27: 631-8 View review abstract online	
Comparison	**PTSD symptoms following exposure to mass shootings (an incident occurring in a public place, during which the primary weapon is a firearm, the event involves four or more victim deaths, the victims are indiscriminately selected, and there is no identifiable socio-political motivation).**
Summary of evidence	**Moderate to high quality evidence (large sample size, inconsistent, precise, direct) found a small association between greater level of exposure to mass shootings (closer proximity, longer duration) and increased PTSD symptoms. There were no moderating effects of time since shooting.**
Mass shootings	
A small association was found between greater level of exposure to mass shootings (proximity, duration) and more PTSD symptoms;	

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11 studies, N = 8,047, *r* = 0.19, 95%CI 0.13 to 0.25, *p* < 0.001, I^2 = 88% There were no moderating effects of sex, age, or time since shooting.	
Consistency in results	Inconsistent
Precision in results	Precise
Directness of results	Direct

Explanation of acronyms

CI = confidence interval, I^2 = the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance), N = number of participants, OR = odds ratio, *p* = probability of a statistically significant effect, Q = test for heterogeneity, *r* = correlation coefficient, 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[16].

† 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[16].

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[17]. 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[16];

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

§ 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[18].

‖ 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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