

Age

Introduction

Personal characteristics, such as age, can influence one's degree of risk for developing PTSD. How such personal characteristics may affect the development of PTSD would be influenced by other personal characteristics as well as differences in the trauma experience itself. This summary table presents the evidence for risk of PTSD in people at different ages.

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-analysis¹. 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 11 systematic reviews that met our inclusion criteria³⁻¹³.

- High quality evidence found a small association between younger age and more PTSD symptoms in professionals indirectly exposed to trauma through their therapeutic work with trauma victims.
- Moderate to high quality evidence found a small association between younger age and more PTSD symptoms in women following childbirth.
- Moderate to low quality evidence found a medium to large association between older age and more PTSD symptoms following a burn injury.
- Moderate quality evidence found small associations between being older and increased risk of PTSD in both adults and children following earthquakes. Although there was no effect of age on risk of PTSD following exposure to any disaster in youth (≤ 18 years), nor was there any effect of age on PTSD following any other trauma in youth.
- Moderate quality evidence found a medium-sized effect of more PTSD symptoms in older adults (>60-65 years) than younger adults following exposure to any natural disaster.
- Moderate quality evidence found a medium-sized effect of fewer PTSD symptoms in older adults (>60-65 years) than younger



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adults following exposure to any man-made disaster. Authors suggest the disparity in findings between natural and human-induced disasters may be explained by older adults being less likely to receive advanced warnings or evacuate, and therefore experience greater disruption or perceived loss. Whereas in the case of human-induced disasters, previous experiences may have better prepared older people to cope with such adversity.

- Moderate quality evidence found no effect of age on risk of PTSD in the elderly after a fall (age 65 to 90 vs. over 90 years).
- Moderate quality evidence found no effect of age on risk of PTSD following a traumatic brain injury.
- Moderate to high quality evidence no effect of age on risk of PTSD in combat-exposed military personnel and veterans.



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Ayers S, Bond R, Bertullies S, Wijma K

The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework

Psychological Medicine 2016; 46: 1121-34

[View review abstract online](#)

Comparison	The effect of age on risk of PTSD following childbirth.
Summary of evidence	Moderate to high quality evidence (large sample, inconsistent, precise, direct) found a small effect showing younger age was associated with increased risk of PTSD following childbirth.
Childbirth	
<i>A small effect showed younger age was associated with increased risk of PTSD; 12 studies, N = 6,196, r = -0.03, 95%CI -0.06 to -0.01, Qp < 0.05</i>	
Consistency in results[‡]	Inconsistent
Precision in results[§]	Precise
Directness of results	Direct

Bloch F

Literature review and meta-analysis of risk factors for delayed post-traumatic stress disorder in older adults after a fall

International Journal of Geriatric Psychiatry 2017; 32: 136-40

[View review abstract online](#)

Comparison	Effect of age on risk of PTSD in older adults (≥65-90 vs. >90 years) after a fall (up to 24 weeks).
Summary of evidence	Moderate quality evidence (small to medium-sized sample, consistent, imprecise, direct) found no differences in rates of PTSD after a fall between people aged between 65 and 90 and in people aged over 90 years.
Falls in the elderly	
<i>There was no association with age;</i>	



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3 studies, N = 211, OR = 1.88, 95%CI 0.81 to 4.38, $p > 0.05$, $I^2 = 0\%$

Consistency in results	Consistent
Precision in results	Imprecise
Directness of results	Direct

Crossen MC, Scholten AC, Lingsma HF, Synnot A, Haagsma J, Steyerberg PEW, Polinder S

Predictors of Major Depression and Posttraumatic Stress Disorder Following Traumatic Brain Injury: A Systematic Review and Meta-Analysis

Journal of Neuropsychiatry and Clinical Neurosciences 2017; 29: 206-24

[View review abstract online](#)

Comparison	Effect of age on risk of PTSD following a traumatic brain injury.
Summary of evidence	Moderate quality evidence (large sample, inconsistent, imprecise, direct) found no effect of age on risk of PTSD following a traumatic brain injury.

Traumatic brain injury

There was no association with age;

5 studies, N = 717, MD = 1.02, 95%CI -1.46 to 3.49, $p > 0.05$, $I^2 = 75\%$

Consistency in results	Inconsistent
Precision in results	Imprecise
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

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Comparison	Effect of age on risk of PTSD symptoms in youth (≤ 18 years) after disasters.
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Summary of evidence	Moderate quality evidence (large sample, direct) found no effect of age on risk of PTSD following exposure to disasters in youth.
Disasters	
<i>There was no association with age;</i> 26 studies, N = 24,657, $r = -0.05$, $p > 0.10$	
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

Giannoni-Pastor A, Eiroa-Orosa FJ, Fidel Kinori SG, Arguello JM, Casas M

Prevalence and Predictors of Posttraumatic Stress Symptomatology Among Burn Survivors: A Systematic Review and Meta-Analysis

Journal of Burn Care and Research 2016; 37: e79-89

[View review abstract online](#)

Comparison	Effect of age on risk of PTSD symptoms following a burn injury.
Summary of evidence	Moderate to low quality evidence (small samples, direct) found a medium to large effect showed older age was associated with increased PTSD symptoms following a burn injury.
Burn injury	
<i>A medium to large effect showed older age was associated with increased PTSD symptoms following a burn injury;</i> 1 study, N = 60, $r = 0.36$	
Consistency in results	No measure of consistency is reported.
Precision in results	No measure of precision is reported.
Directness of results	Direct

Hensel JM, Ruiz C, Finney C, Dewa CS

Meta-analysis of risk factors for secondary traumatic stress in therapeutic

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work with trauma victims

Journal of Traumatic Stress 2015; 28: 83-91

[View review abstract online](#)

Comparison	Effect of age on risk of PTSD in professionals indirectly exposed to trauma through their therapeutic work with trauma victims.
Summary of evidence	High quality evidence (large samples, consistent, precise, direct) found a small association between older age and less severe PTSD in professionals indirectly exposed to trauma through their therapeutic work with trauma victims.
Secondary workplace trauma	
<i>A small association was found between older age and less severe PTSD; 15 studies, N = 2,491, r = -0.05, 95%CI -0.10 to -0.00, p < 0.05, I² = 27%</i>	
Consistency in results	Consistent
Precision in results	Precise
Directness of results	Direct

Parker G, Lie D, Siskind DJ, Martin-Khan M, Raphael B, Crompton D, Kisely S

Mental health implications for older adults after natural disasters - A systematic review and meta-analysis

International Psychogeriatrics 2016; 28: 11-20

[View review abstract online](#)

Comparison	Effect of age on risk of PTSD symptoms in older adults (>60-65 years) vs. younger adults after natural disasters.
Summary of evidence	Moderate quality evidence (large sample, inconsistent, imprecise, direct) found a medium-sized effect of more PTSD symptoms in older adults (>60-65 years) than younger adults following exposure to natural disasters.
Natural disasters	
<i>A medium-sized effect of more PTSD symptoms in older adults;</i>	



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5 studies, N = 5,779, OR = 2.11, 95%CI 1.40 to 3.17, $p = 0.0004$, $I^2 = 80\%$

Consistency in results	Inconsistent
Precision in results	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	Effect of age on risk of PTSD symptoms in older adults (>60-65 years) vs. younger adults 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 (>60-65 years) than younger adults following exposure to man-made disasters.

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, $p = 0.003$, $I^2 = 89\%$

Authors suggest the disparity in findings between natural and human-induced disasters may be explained by older adults may be at greatest risk of worse outcomes following natural disasters because they are less likely to receive advanced warnings or evacuate, and so experience greater disruption or perceived loss. Whereas in the case of human-induced disasters, previous experiences may have better prepared older people to cope with such adversity.

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

Tang B, Deng Q, Glik D, Dong J, Zhang L



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A Meta-Analysis of Risk Factors for Post-Traumatic Stress Disorder (PTSD) in Adults and Children after Earthquakes

International Journal of Environmental Research and Public Health 2017; 14: 1537

[View review abstract online](#)

Comparison	Effect of age on risk of PTSD after earthquakes.
Summary of evidence	Moderate quality evidence (large sample, inconsistent, imprecise, direct) found small associations between being older and increased risk of PTSD in both adults and children following earthquakes.
Earthquakes	
<p>15 studies, N = 22,931</p> <p><i>Small effects showed being older was associated with increased PTSD in both adults and children;</i></p> <p>Adults: OR = 1.17, 95%CI 1.08 to 1.27, $p < 0.05$</p> <p>Children: OR = 1.34, 95%CI 1.12 to 1.61, $p < 0.05$</p>	
Consistency in results	Authors report data are inconsistent.
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	Effect of age on risk of PTSD in children and adolescents following any trauma.
Summary of evidence	Moderate to high quality evidence (unclear sample size, consistent, precise, direct) found no effect of age.
Any trauma exposure	



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<p><i>No effect of age on risk of PTSD;</i> 18 studies, N not reported, $r = -0.03$, 95%CI -0.04 to 0.10, $p > 0.05$, $Qp > 0.05$</p>	
Consistency in results	Consistent
Precision in results	Precise
Directness of results	Direct

<p><i>Xue C, Ge Y, Tang B, Liu Y, Kang P, Wang M, Zhang L</i> A meta-analysis of risk factors for combat-related PTSD among military personnel and veterans PLoS ONE 2015; 10: e0120270 View review abstract online</p>	
Comparison	Effect of age on risk of risk of PTSD in military personnel and veterans.
Summary of evidence	Moderate to high quality evidence (large samples, inconsistent, precise, direct) found no effect of age on risk of PTSD in military personnel and veterans.
Military personnel and veterans	
<p>32 studies, N = 413,580 <i>There was no effect of age on risk of PTSD;</i> 24 studies, OR = 0.97, 95%CI 0.88 to 1.06, $p > 0.05$, $I^2 = 92\%$</p>	
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 = statistical probability of obtaining that result, 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 small¹⁴.

† 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 effect¹⁴.

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 ¹⁵. InOR stands for logarithmic OR where a InOR 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 between variables. They can provide an indirect indication of prediction, but do not



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confirm causality due to possible and often unforeseen 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.

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 relaxed¹⁶.

‡ 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 formula¹⁴;

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

|| 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.

§ 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



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