TECHNICAL COMMENTARY

Physical injury and illness

NeuRA Discover. Conquer. Cure.

POST-TRAUMATIC STRESS DISORDER LIBRARY

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 the risk of PTSD following physical injury and illness, including injury and illness in loved ones.

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 15 systematic reviews that met our inclusion criteria[3-17].

- Moderate quality evidence found a medium-sized effect that people with a traumatic brain injury (TBI) were more likely to have a diagnosis of PTSD than people without a TBI. Rates of PTSD were higher in military than civilian TBI samples, in TBI samples with more males than females, in TBI samples exposed to a blast rather than a motor vehicle accident, in TBI samples from the USA than from other countries, and in samples with a TBI rather than another physical injury. Shorter post-trauma amnesia and more memory of the traumatic event were also associated with increased risk of PTSD following a traumatic brain injury.
- Moderate quality evidence found the average prevalence of PTSD after a fall in the elderly was 27.5%, which represents a small increased risk in PTSD compared to older people with no fall history.
- Moderate quality evidence found risk factors associated with PTSD following a burn injury include (in descending order of effect); more

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

life threat perception, intrusion symptoms, pain, low socioeconomic status, alcohol use disorders, increased age, avoidance symptoms, dissociation, negative emotions or distress, acute stress symptoms, being unmarried, having previous psychiatric disorders, substance use disorders, need for psychological treatment, being injured by an explosion, more body surface area affected, more anxiety and depression, longer hospitalisation stay, having low openness, being female, having more surgeries, low narcissism, and feeling responsible for the burn injury.

- Moderate to high quality evidence found the prevalence of PTSD after acute orthopaedic trauma was around 26.6% and the prevalence of both PTSD and depression is around 16.8%. Rates were higher in females than males, and in patients with lower extremity fractures (including pelvic) than upper extremity fractures.
- Moderate quality evidence found the prevalence of PTSD symptoms in critical illness survivors was between 25% and 44% up to 6 months post-ICU, and between 17% and 34% by 12 months. ICU risk factors for PTSD symptoms included benzodiazepine administration and post-ICU memories of frightening ICU experiences.
- Moderate to high quality evidence found associations between PTSD symptoms after a spinal cord injury and the following risk factors (in descending order of effect); depressed mood, poor cognition, distress, anxiety, pain severity, history of previous trauma, female sex, being married, less time since trauma, and having a higher education.
- Moderate quality evidence found the prevalence of PTSD following a coronavirus infection was around 29-32%. Rates of PTSD were higher in female patients than male patients, in infected healthcare workers, in patients with a previous physical illness, in patients with avascular necrosis, functional impairment, pain, and a sense of lack of control. Rates were highest when measured after coronavirus outbreaks, in patients with MERS, and in studies using the Impact of Event scale to measure PTSD.
- Moderate quality evidence found the prevalence of PTSD in people with chronic pain was around 9.7%. PTSD prevalence was higher in people with chronic widespread pain and headache, and lower in people with back pain. Prevalence was higher in studies using self-reported PTSD symptoms than in studies using clinical interviews to assess PTSD.
- Moderate to high quality evidence 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 using self-report instruments than clinical assessments, in samples with brain cancer, in samples undergoing chemotherapy, in Middle Eastern samples, in people with prior trauma, in younger people, and in people with a longer time since cancer diagnosis.
- 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 highest in parents of children with epilepsy or diabetes, in mothers, in parents of children with more illness severity, longer treatment duration and intensity, and in parents of children with PTSD symptoms. Rates were lowest in parents of children with longer illness duration, longer time since active treatment, and in those with more social support.
- Moderate to high quality evidence found the overall prevalence of PTSD in children after an injury was around 20.5%. Rates were highest in girls, in older children and in children injured in hurricanes.
- Moderate to low quality evidence found no difference in rates of PTSD in people exposed to normal sedation protocols, light sedation or daily interruption of normal sedation to reduce time on mechanical ventilation.

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

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	**PTSD in older adults (≥65 years) after a fall (up to 24 weeks).**
Summary of evidence	**Moderate quality evidence (small to medium-sized samples, consistent, imprecise, direct) found the average prevalence of PTSD after a fall was 27.5%, which represents a small, significant increase in risk compared to older people with no previous fall.**
Falls in the elderly	
3 studies, N = 211, prevalence = 27.5% *A small, significant increase in the risk of PTSD in older people with a fall compared to older people without a fall;* 2 studies, OR = 2.79, 95%CI 1.03 to 7.53, $p < 0.05$	
Consistency in results	Authors report the OR data are consistent
Precision in results	Imprecise for OR
Directness of results	Direct

Cnossen 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	**Risk of PTSD following traumatic brain injury.**
Summary of evidence	**Moderate quality evidence (medium-sized samples, consistent, imprecise, direct) found shorter post-trauma amnesia and more memory of the traumatic event were both associated with increased risk of PTSD following a traumatic brain injury.**

Traumatic brain injury	
Factors associated with increased risk of PTSD in people with a traumatic brain injury; Shorter post-trauma amnesia: 3 studies, N = 477, MD = -8.07, 95%CI -15.46 to -0.69, I^2 = 33% Memory of the traumatic event: 2 studies N = 240, OR = 5.15, 95%CI 2.37 to 11.21, I^2 = 0% There were no associations with age, education, or sex.	
Consistency in results	Consistent
Precision in results	Imprecise
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	Risk factors for PTSD symptoms following a burn injury.
Summary of evidence	**Moderate quality evidence (large samples, direct) found risk factors associated with PTSD following a burn injury include (in descending order of effect); more life threat perception, intrusion symptoms, pain, low socioeconomic status, alcohol use disorders, increased age, avoidance symptoms, dissociation, negative emotions or distress, acute stress symptoms, being unmarried, having previous psychiatric disorders, substance use disorders, need for psychological treatment, being injured by an explosion, more body surface area affected, more anxiety and depression, longer hospitalisation stay, having low openness, being female, having more surgeries, low narcissism, and feeling responsible for the burn injury.**
Burn injury	
19 studies, N = 2,672 Prevalence ranged from 3.3% to 35.1% at 1 month, 2.2% to 40% at 3 to 6 months, 9% to 45.2% within the year post-injury, and 6.7% to 25.4% more than 2 years later. *The following risk factors were associated with increased PTSD symptoms following a burn injury (in descending order of effect);*	

Life threat perception: 1 study, N = 428, *r* = 0.98
Intrusion: 3 studies, N = 154, *r* = 0.42
Pain: 2 studies, N = 287, *r* = 0.39
Low socioeconomic status: 4 studies, N = 621, *r* = 0.37
Alcohol use disorder: 1 study, N = 95, *r* = 0.37
Increased age: 1 study, N = 60, *r* = 0.36
Avoidance: 4 studies, N = 185, *r* = 0.35
Dissociation: 2 studies, N = 323, *r* = 0.33
Negative emotions or distress: 6 studies, N = 445, *r* = 0.32
Acute stress symptoms: 4 studies, N = 645, *r* = 0.29
Unmarried patients: 1 study, N = 82, *r* = 0.28
Previous psychiatric disorders: 2 studies, N = 251, *r* = 0.28
Substance use disorder: 1 study, N = 95, *r* = 0.27
Need for treatment: 3 studies, N = 297, *r* = 0.27
Injured by explosion: 1 study, N = 60, *r* = 0.26
Total body surface area: 4 studies, N = 452, *r* = 0.26
Anxiety: 3 studies, N = 383, *r* = 0.24
Depression: 4 studies, N = 311, *r* = 0.23
Length of hospitalisation: 4 studies, N = 561, *r* = 0.23
Low openness: 4 studies, N = 214, *r* = 0.20
Female sex: 4 studies, N = 554, *r* = 0.20
Number of surgeries: 1 study, N = 178, *r* = 0.20
Low narcissism: 2 studies, N = 74, *r* = 0.17
Burn injury attribution of responsibility: 2 studies, N = 144, *r* = 0.13

Consistency in results	No measure of consistency is reported.
Precision in results	No measure of precision is reported.
Directness of results	Direct

Loignon A, Ouellet MC, Belleville G

A systematic review and meta-analysis on PTSD following TBI among military/veteran and civilian populations

Journal of Head Trauma Rehabilitation 2020; 35: E21-E35

View review abstract online	
Comparison	**PTSD following a traumatic brain injury (TBI) vs. no TBI in military and civilian samples.**
Summary of evidence	**Moderate quality evidence (large samples, inconsistent, imprecise, direct) found a medium-sized effect that people with a TBI were significantly more likely to have a diagnosis of PTSD than people without TBI. Rates were higher in military than civilian samples, in samples with more males than females, in samples with TBI rather than another physical injury, in samples exposed to a blast rather than a motor vehicle accident, and in studies from the USA.**
Traumatic brain injury	
A medium-sized effect showed people with a TBI were significantly more likely to have a diagnosis of PTSD than people without a TBI; OR = 2.68, 95%CI 2.00 to 3.70, $p < 0.001$, $I^2 = 94.2\%$ *A large effect showed military personnel with a TBI were significantly more likely to have a diagnosis of PTSD than those without a TBI;* OR = 4.18, 95%CI 2.90 to 6.00, $p < 0.001$, I^2 not reported *A small effect showed civilians with a TBI were significantly more likely to have a diagnosis of PTSD than those without a TBI;* OR = 1.26, 95%CI 1.00 to 1.60, $p = 0.046$, I^2 not reported Studies with more males had a greater risk of PTSD than samples with more females. Studies from the United States had a greater risk of PTSD than samples from other countries. Studies with an unknown injury comparison group rather than another physical injury comparison group had a greater risk of PTSD in the TBI groups. Studies of people with TBI from blast injuries rather than motor vehicle accidents had a greater risk of PTSD. There were no significant moderating effects of time since injury, TBI severity, study design, diagnostic tool for assessing PTSD or TBI, age, sample size, or study quality.	
Consistency in results	Inconsistent
Precision in results	Imprecise
Directness of results	Direct

Muscatelli S, Spurr H, O'Hara NN, O'Hara LM, Sprague SA, Slobogean GP

Prevalence of Depression and Posttraumatic Stress Disorder After Acute

Orthopaedic Trauma: A Systematic Review and Meta-Analysis

Journal of Orthopaedic Trauma 2017; 31: 47-55

View review abstract online

Comparison	**PTSD after acute orthopaedic trauma.**
Summary of evidence	**Moderate to high quality evidence (large samples, consistent, appears imprecise, direct) found the prevalence of PTSD after acute orthopaedic trauma was around 26.6% and the prevalence of both PTSD and depression is around 16.8%. Rates were higher in females than males, and in patients with lower extremity fractures (including pelvic) than upper extremity fractures.**
Acute orthopaedic trauma	
PTSD: 11 studies, N = 1,867 prevalence = 26.6%, 95%CI 19.0% to 35.9%, I^2 = 0% PTSD + depression: 3 studies, N = 473, prevalence = 16.8%, 95%CI 9.0% to 29.4%, I^2 = 0% *Female patients were significantly more likely than males to experience PTSD after injury;* OR = 4.36, 95%CI 1.82 to 10.43, *p* = 0.001 *People with lower extremity fractures, including pelvic fractures, were significantly more likely to have PTSD symptoms after injury when compared to people with upper extremity fractures;* OR = 2.31, 95%CI 1.03 to 5.17, *p* = 0.043 There were no moderating effects of having multiple injuries vs. a single injury.	
Consistency in results	Consistent
Precision in results	Appears imprecise
Directness of results	Direct

Nassar AP, Jr., Zampieri FG, Ranzani OT, Park M

Protocolized sedation effect on post-ICU posttraumatic stress disorder prevalence: A systematic review and network meta-analysis

Journal of Critical Care 2015; 30: 1278-82

View review abstract online

Comparison	**PTSD after reduced sedation (for shorter mechanical ventilation) vs. normal sedation protocols.**

Summary of evidence	**Moderate to low quality evidence (small samples, some inconsistency, imprecise, direct) found no difference in rates of PTSD between normal sedation protocols and light sedation or daily interruption of normal sedation.**
Reduced sedation	
No significant differences between groups in rates of PTSD; Daily interruption of normal sedation: 2 studies, N = 92, OR = 0.66, 95%CI 0.22 to 1.98, $p > 0.05$ Light sedation: 2 studies, N = 47, OR = 0.90, 95%CI 0.27 to 3.05, $p > 0.05$	
Consistency in results	Moderate heterogeneity in network analysis ($I^2 = 40\%$).
Precision in results	Imprecise
Directness of results	Direct

Parker AM, Sricharoenchai T, Raparla S, Schneck KW, Bienvenu OJ, Needham DM

Posttraumatic stress disorder in critical illness survivors: a metaanalysis

Critical Care Medicine 2015; 43: 1121-9

View review abstract online

Comparison	**PTSD symptoms in critical illness survivors.**
Summary of evidence	**Moderate quality evidence (large samples, inconsistent, appears imprecise, direct) found the prevalence of PTSD symptoms in critical illness survivors was between 25% and 44% up to 6 months post-ICU, and between 17% and 34% by 12 months. ICU risk factors for PTSD symptoms included benzodiazepine administration and post-ICU memories of frightening ICU experiences.**
Critical illness survivors	
Impact of Event Scale score cut-off of ≥20 1-6 months post-ICU: 6 studies, N = 456, prevalence = 44%, 95%CI 36% to 52%, $I^2 = 62\%$ 7-12 months post-ICU: 5 studies, N = 698, prevalence = 17%, 95%CI 10% to 26%, $I^2 = 85\%$ Impact of Event Scale score cut-off of ≥35 1-6 months post-ICU: 6 studies, N = 456, prevalence = 25%, 95%CI 17% to 34%, $I^2 = 68\%$ 7-12 months post-ICU: 5 studies, N = 698, prevalence = 34%, 95%CI 22% to 50%, $I^2 = 93\%$ ICU risk factors for posttraumatic stress disorder symptoms included benzodiazepine administration	

and post-ICU memories of frightening ICU experiences. Posttraumatic stress disorder symptoms were associated with worse quality of life. In European-based studies an ICU diary was associated with a significant reduction in posttraumatic stress disorder symptoms, a self-help rehabilitation manual was associated with significant posttraumatic stress disorder symptom reduction at 2 months, but not 6 months; and a nurse-led ICU follow-up clinic did not reduce posttraumatic stress disorder symptoms.	
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 highest in parents of children with epilepsy or diabetes, in mothers, in parents of children with more illness severity, longer treatment duration and intensity and in parents of children with PTSD symptoms. Rates were lowest in parents of children with longer illness duration, longer time since active treatment and in those with more social support.**
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, $p < 0.001$, $Qp = 0.151$ Parental PTSD symptoms were most prevalent among parents of children with epilepsy ($g = 1.25$), and diabetes ($g = 1.16$), and were positively associated with being the mother ($r = 0.19$), increased illness severity ($r = 0.18$), more treatment duration/intensity ($r = 0.21$), and PTSS in the child ($r =$	

0.34). Longer illness duration (r = -0.19), longer time since active treatment (r = -0.10), and better social resources (r = -0.17 to -0.07) were 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	**Moderate to high quality evidence (large samples, mostly consistent, precise, direct) found associations between PTSD symptoms after a spinal cord injury and the following risk factors (in descending order of effect); depressed mood, poor cognition, distress, anxiety, pain severity, history of previous trauma, female sex, being married, less time since trauma, and having a higher education.**
Spinal cord injury	
Significant associations were found between more PTSD symptoms and the following risk factors (in descending order of effect); Depressed mood: 6 studies, N = 1,714, r = 0.64, 95%CI 0.54 to 0.72, $p < 0.001$, I^2 = 87% Poor cognition: 2 studies, N = 152, r = 0.63, 95%CI 0.52 to 0.72, $p < 0.001$, I^2 = 0% Distress: 2 studies, N = 512, r = 0.57, 95%CI 0.50 to 0.62, $p < 0.001$, I^2 = 0% Anxiety: 3 studies, N = 590, r = 0.56, 95%CI 0.49 to 0.61, $p < 0.001$, I^2 = 0% Pain severity: 4 studies, N = 493, r = 0.35, 95%CI 0.27 to 0.43, $p < 0.01$, $p < 0.001$, I^2 = 0% History of previous trauma: 3 studies, N = 228, r = 0.17, 95%CI 0.04 to 0.29, p = 0.01, I^2 = 0% Female sex: 10 studies, N = 1,213, r = 0.14, 95%CI 0.09 to 0.19, $p < 0.001$, I^2 = 0% Being married: 4 studies, N = 358, r = 0.13, 95%CI 0.03 to 0.23, p = 0.01, I^2 = 0% Less time since trauma: 7 studies, N = 716, r = -0.12, 95%CI -0.19 to -0.05, $p < 0.001$, I^2 = 29% Higher education: 5 studies, N = 453, r = 0.10, 95%CI 0.01 to 0.19, p = 0.03, I^2 = 0%	

There were no significant associations with psychiatric history, age, injury severity, alcohol or substance use disorders, and loss of consciousness.	
Consistency in results	Consistent, apart from depressed mood.
Precision in results	Precise
Directness of results	Direct

Rogers JP, Chesney E, Oliver D, Pollak TA, McGuire P, Fusar-Poli P, Zandi MS, Lewis G, David AS

Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic

The Lancet Psychiatry 2020; 7: 611-27

View review abstract online

Comparison	**Prevalence of PTSD in people post-coronavirus illness (severe acute respiratory syndrome [SARS], Middle East respiratory syndrome [MERS], or coronavirus disease 2019 [COVID-19]). Follow-up time varied between 60 days and 12 years.**
Summary of evidence	**Moderate quality evidence (large sample size, appears inconsistent, mostly imprecise, direct) found the mean prevalence of PTSD following a coronavirus infection was around 32%. Rates of PTSD were higher in females than males, in infected healthcare workers than other patients, in people with a previous physical illness, in people with avascular necrosis, functional impairment, pain, and a sense of lack of control.**

Prevalence of PTSD after a coronavirus infection

4 studies, N = 402, point prevalence of PTSD = 32.2%, 95%CI 23.7% to 42.0%

Rates of PTSD were higher in (in descending order of effect);

People with a previous physical illness: OR = 4.38, 95% CI 1.06 to 18.02

Females: OR = 3.85, 95%CI 1.18 to 12.54

Infected healthcare workers: OR = 2.92, 95%CI 1.08 to 7.88

People with avascular necrosis: OR = 2.91, 95%CI 1.06 to 8.02

People with functional impairment: OR = 2.44, 95%CI 1.66 to 3.56

People in pain: OR = 1.69, 95%CI 1.31 to 2.19 People with a sense of lack of control: OR = 1.22, 95%CI 1.09 to 1.37	
Consistency in results	Appears inconsistent
Precision in results	Mostly imprecise
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

View review abstract online

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 in longitudinal cohort studies, when measured after outbreaks, in patients with MERS, and in studies using the Impact of Event scale to measure PTSD.**
PTSD symptoms during coronavirus outbreaks	
10 studies, N = 794, prevalence rate = 29%, 95%CI 18% to 39%, I^2 = 96% Prevalence was higher in cohort studies (36%) than in cross-sectional studies (13%). Prevalence was higher when measured after outbreaks (37%), in MERS (40%) than SARS (28%) patients, and in studies using the Impact of Event scale (40%).	
Consistency in results	Inconsistent
Precision in results	Appears imprecise
Directness of results	Direct

Siqveland J, Hussain A, Lindstrom JC, Ruud T, Hauff E

Prevalence of posttraumatic stress disorder in persons with chronic pain: A meta-analysis

Frontiers in Psychiatry 2017; 8: 164

View review abstract online

Comparison	**PTSD in people with chronic pain.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, appears imprecise, direct) finds the prevalence of PTSD in people with chronic pain is around 9.7%. PTSD prevalence was higher in people with chronic widespread pain and headache, and lower in people with back pain. Prevalence was higher in studies using self-reported PTSD symptoms than in studies using clinical interviews to assess PTSD.**
PTSD in people with chronic pain	
21 studies, N = 6,750, prevalence = 9.7%, 95%CI 5.2% to 17.1%, I^2 = 98.6% PTSD prevalence was higher in people with chronic widespread pain (20.5%), and headache (11.2%), and lower in people with back pain (0.3%). Prevalence was higher in studies using self-reported PTSD symptoms (20.4%) than in studies using clinical interviews (4.5%).	
Consistency in results	Inconsistent
Precision in results	Appears 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 using self-report instruments than clinical assessments, in**

	samples with brain cancer, in samples undergoing chemotherapy, in Middle Eastern samples, in people with prior trauma, in younger people, and in 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 using self-report instruments than clinical assessments, in samples with brain cancer, in samples undergoing chemotherapy, in Middle Eastern samples, in people with prior trauma, in younger people, and in people with a longer time since cancer diagnosis.	
Consistency in results	Consistent
Precision in results	Imprecise
Directness of results	Direct

van Warmerdam J, Zabih V, Kurdyak P, Sutradhar R, Nathan PC, Gupta S

Prevalence of anxiety, depression, and posttraumatic stress disorder in parents of children with cancer: A meta-analysis

Pediatric Blood and Cancer 2019; 66: e27677

View review abstract online

Comparison	**Prevalence of PTSD in parents of children with cancer.**
Summary of evidence	**Moderate quality evidence (large sample size, inconsistent, appears imprecise, direct) found the prevalence of PTSD in parents of children with cancer was around 26%.**
Prevalence of PTSD in parents of children with cancer	
31 studies, N = 5,501, prevalence = 26%, 95%CI 22% to 32%, I^2 = 96% Prevalence of PTSD was consistently higher in parents of children with cancer than in noncancer parental controls. There were no moderating effects of parental gender, child's cancer phase, or study methodology.	
Consistency in results	Inconsistent
Precision in results	Appears imprecise

Directness of results	Direct

Yu H, Nie C, Zhou Y, Wang X, Wang H, Shi X

Epidemiological Characteristics and Risk Factors of Posttraumatic Stress Disorder in Chinese Children After Exposure to an Injury

Disaster Medicine and Public Health Preparedness 2019; Oct: 1-8

View review abstract online

Comparison	**PTSD in children after an injury.**
Summary of evidence	**Moderate to high quality evidence (large sample size, inconsistent, appears precise, direct) finds the overall prevalence of PTSD after an injury is 20.52%. Rates were highest in girls, in older children and in children injured in hurricanes.**
PTSD in children after an injury	
47 studies, N = 65 298, prevalence = 20.52%, 95%CI 17% to 23%, I^2 = 99.7% Prevalence was higher in girls than in boys (24.61% vs 19.36%), in older than younger children (senior high school = 51.82%, junior high school = 37.12%, primary school = 14.02%), and in children of ethnic minority than in Han Chinese children (35.38% vs. 13.50%). Prevalence of PTSD in children was 57.5% after hurricanes, 23.6% after an earthquake, 8.9% after mudslides, and 2.3% after floods.	
Consistency in results	Inconsistent
Precision in results	Appears 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), ICU = intensive care unit, N = number of participants, MD = mean difference, OR = odds ratio, *p* = probability of a statistically significant effect, *r* = correlation coefficient, vs. = versus

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[18].

---

† 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[18].

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[19]. 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

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[18];

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

§ 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[20].

‖ 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.

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au

References

1. Moher D, Liberati A, Tetzlaff J, Altman DG, PRISMAGroup (2009): Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *British Medical Journal* 151: 264-9.
2. GRADEWorkingGroup (2004): Grading quality of evidence and strength of recommendations. *British Medical Journal* 328: 1490.
3. Bloch F (2017): 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* 32: 136-40.
4. Giannoni-Pastor A, Eiroa-Orosa FJ, Fidel Kinori SG, Arguello JM, Casas M (2016): Prevalence and Predictors of Posttraumatic Stress Symptomatology Among Burn Survivors: A Systematic Review and Meta-Analysis. *Journal of Burn Care and Research* 37: e79-89.
5. Loignon A, Ouellet MC, Belleville G (2020): A systematic review and meta-analysis on PTSD following TBI among military/veteran and civilian populations. *Journal of Head Trauma Rehabilitation* 35: E21-E35.
6. Muscatelli S, Spurr H, O'Hara NN, O'Hara LM, Sprague SA, Slobogean GP (2017): Prevalence of Depression and Posttraumatic Stress Disorder After Acute Orthopaedic Trauma: A Systematic Review and Meta-Analysis. *Journal of Orthopaedic Trauma* 31: 47-55.
7. Parker AM, Sricharoenchai T, Raparla S, Schneck KW, Bienvenu OJ, Needham DM (2015): Posttraumatic stress disorder in critical illness survivors: a metaanalysis. *Critical Care Medicine* 43: 1121-9.
8. Rogers JP, Chesney E, Oliver D, Pollak TA, McGuire P, Fusar-Poli P, *et al.* (2020): Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. *The Lancet Psychiatry* 7: 611-27.
9. Salehi M, Amanat M, Mohammadi M, Salmanian M, Rezaei N, Saghazadeh A, *et al.* (2021): The prevalence of post-traumatic stress disorder related symptoms in Coronavirus outbreaks: A systematic-review and meta-analysis. *Journal of Affective Disorders* 282: 527-38.
10. Siqveland J, Hussain A, Lindstrom JC, Ruud T, Hauff E (2017): Prevalence of posttraumatic stress disorder in persons with chronic pain: A meta-analysis. *Frontiers in Psychiatry* 8: 164.
11. Yu H, Nie C, Zhou Y, Wang X, Wang H, Shi X (2019): Epidemiological Characteristics and Risk Factors of Posttraumatic Stress Disorder in Chinese Children After Exposure to an Injury. *Disaster Medicine and Public Health Preparedness* Oct: 1-8.
12. Nassar AP, Jr., Zampieri FG, Ranzani OT, Park M (2015): Protocolized sedation effect on post-ICU posttraumatic stress disorder prevalence: A systematic review and network meta-analysis. *Journal of Critical Care* 30: 1278-82.
13. Pinquart M (2019): Posttraumatic Stress Symptoms and Disorders in Parents of Children and Adolescents With Chronic Physical Illnesses: A Meta-Analysis. *Journal of Traumatic Stress* 32: 88-96.
14. Pollock K, Dorstyn D, Butt L, Prentice S (2017): Posttraumatic stress following spinal cord injury: a systematic review of risk and vulnerability factors. *Spinal Cord* 55: 800-11.
15. Swartzman S, Booth JN, Munro A, Sani F (2017): Posttraumatic stress disorder after cancer diagnosis in adults: A meta-analysis. *Depression and Anxiety* 34: 327-39.
16. van Warmerdam J, Zabih V, Kurdyak P, Sutradhar R, Nathan PC, Gupta S (2019): Prevalence of anxiety, depression, and posttraumatic stress disorder in parents of children with cancer: A meta-analysis. *Pediatric Blood and Cancer* 66: e27677.
17. Cnossen MC, Scholten AC, Lingsma HF, Synnot A, Haagsma J, Steyerberg PEW, *et al.* (2017): Predictors of Major Depression and Posttraumatic Stress Disorder Following Traumatic Brain Injury: A Systematic Review and Meta-Analysis. *Journal of Neuropsychiatry and Clinical Neurosciences* 29: 206-24.
18. CochraneCollaboration (2008): Cochrane Handbook for Systematic Reviews of Interventions. Accessed 24/06/2011.
19. Rosenthal JA (1996): Qualitative Descriptors of Strength of Association and Effect Size. *Journal of Social Service Research* 21: 37-59.

20. GRADEpro (2008): [Computer program]. Jan Brozek, Andrew Oxman, Holger Schünemann. *Version 32 for Windows*

Margarete Ainsworth Building, Barker Street, Randwick NSW 2031. Phone: 02 9399 1000. Email: info@neura.edu.au