TECHNICAL COMMENTARY

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Spatial variation

Introduction

Prevalence quantifies the proportion of individuals in a population who have a disease during a specific time period, while incidence refers to the number of new cases of disease that develop in a population during a specific time period. Point prevalence is the proportion of individuals who manifest a disorder at a given point in time, period measures the proportion of individuals who manifest a disorder during a specified period (e.g. 1 year), lifetime is the proportion of individuals in the population who have ever manifested a disorder who are alive on a given day, and lifetime morbid risk also includes those deceased at the time of the survey.

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

- Moderate quality evidence finds the overall lifetime prevalence of PTSD in the population is around 3.9%. Lifetime rates were higher in high-income countries (5%) than in upper-middle or low-middle income countries (both around 2%). Lifetime rates were higher in the WHO Western Pacific region (5.7%), the Western European region (4.0%) and the Americas (3.8%), than in the Eastern European region (2.4%), Africa (2.3%) and the Eastern Mediterranean region (2.1%).
- Moderate quality evidence finds the pooled current and lifetime prevalence of PTSD in the Eastern Mediterranean region is around 7%.
- Moderate quality evidence finds the 10-year prevalence of PTSD in South Asia (India, Pakistan, Nepal, Sri Lanka, and Bangladesh) is around 17%.

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Koenen KC, Ratanatharathorn A, Ng L, McLaughlin KA, Bromet EJ, Stein DJ, Karam EG, Meron Ruscio A, Benjet C, Scott K, Atwoli L, Petukhova M, Lim CCW, Aguilar-Gaxiola S, Al-Hamzawi A, Alonso J, Bunting B, Ciutan M, de Girolamo G, Degenhardt L, Gureje O, Haro JM, Huang Y, Kawakami N, Lee S, Navarro-Mateu F, Pennell BE, Piazza M, Sampson N, Ten Have M, Torres Y, Viana MC, Williams D, Xavier M, Kessler RC

Posttraumatic stress disorder in the World Mental Health Surveys

Psychological Medicine *2017;* 47: 2260-74.

View review abstract online

Comparison	**Spatial variation in the prevalence of PTSD (DSM-4).** **Note: This review included data from 26 World Mental Health Surveys across 24 countries but was not strictly a systematic review. The trauma exposed group had documented exposure.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, direct) finds the overall lifetime prevalence of PTSD in the population is around 3.9%. Rates were higher in high-income countries (5%) than in upper-middle or low-middle income countries (both around 2%). They were higher in the WHO Western Pacific region (5.7%), the Western European region (4.0%) and the Americas (3.8%), than in the Eastern European region (2.4%), Africa (2.3%) and the Eastern Mediterranean region (2.1%).**

PTSD

26 population surveys, N = 71,083, overall lifetime prevalence = 3.9%, in trauma exposed = 5.6%

Lifetime prevalence rates varied across WHO regions;

Western Pacific: N = 19,085, overall prevalence = 5.7%, trauma exposed = 7.7%

Western European: N = 14,300, overall prevalence = 4.0%, trauma exposed = 6.3%

The Americas: N = 16,851, overall prevalence = 3.8%, trauma exposed = 4.8%

Eastern European: N = 6,310, overall prevalence = 2.4%, trauma exposed = 4.9%

Africa: N = 4,315, overall prevalence = 2.3%, trauma exposed = 3.0%

Eastern Mediterranean: N = 10,222, overall prevalence = 2.1%, trauma exposed = 3.2%

Lifetime prevalence varied significantly across countries and across and within income groups;

High-income countries

All: N = 42,308, overall prevalence = 5.0%, trauma exposed = 6.9%

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Northern Ireland: N = 1,986, overall prevalence = 8.8%, in trauma exposed = 14.5% Australia: N = 4,463, overall prevalence = 7.3%, in trauma exposed = 9.6% The USA: N = 5,692, overall prevalence = 6.9%, in trauma exposed = 8.3% New Zealand: N = 7,312, overall prevalence = 6.1%, in trauma exposed = 7.6% Portugal: N = 2,060, overall prevalence = 5.3%, in trauma exposed = 7.7% The Netherlands: N = 1,093, overall prevalence = 4.4%, in trauma exposed = 6.7% France: N = 1,436, overall prevalence = 3.9%, in trauma exposed = 5.4% Spain (Murcia): N = 1,459, overall prevalence = 2.8%, in trauma exposed = 4.5% Belgium: N = 1,043, overall prevalence = 2.7%, in trauma exposed = 4.1% Italy: N = 1,779, overall prevalence = 2.4%, in trauma exposed = 4.3% Spain: N = 2,121, overall prevalence = 2.2%, in trauma exposed = 4.0% Germany: N = 1,323, overall prevalence = 1.7%, in trauma exposed = 2.5% Israel: N = 4,859, overall prevalence = 1.6%, in trauma exposed = 2.1% Japan: N = 1,682, overall prevalence = 1.3%, in trauma exposed = 2.1% <u>Upper-middle income countries</u> All: N = 16,913, overall prevalence = 2.3%, in trauma exposed = 3.6% Colombia (Medellin): N = 1,673, overall prevalence = 3.7%, in trauma exposed = 4.9% Lebanon: N = 1,031, overall prevalence = 3.4%, in trauma exposed = 4.2% Brazil: N = 2,941, overall prevalence = 3.2%, in trauma exposed = 4.3% South Africa: N = 4,315, overall prevalence = 2.3%, in trauma exposed = 3.0% Bulgaria: N = 2,233, overall prevalence = 1.9%, in trauma exposed = 6.5% Mexico: N = 2,362, overall prevalence = 1.5%, in trauma exposed = 2.1% Romania: N = 2,357, overall prevalence = 1.2%, in trauma exposed = 2.8% <u>Low-middle income countries</u> All: N = 11,862, overall prevalence = 2.1%, in trauma exposed = 3.0% Ukraine: N = 1,720, overall prevalence = 4.8%, in trauma exposed = 5.7% Iraq: N = 4,332, overall prevalence = 2.5%, in trauma exposed = 4.4% Colombia: N = 2,381, overall prevalence = 1.8%, in trauma exposed = 2.2% Peru: N = 1,801, overall prevalence = 0.7%, in trauma exposed = 0.8% China: N = 1,628, overall prevalence = 0.3%, in trauma exposed = 0.5%	
Consistency in results‡	Inconsistent, rates varied across regions.
Precision in results§	Unable to assess; no confidence intervals are reported.
Directness of results‖	Direct

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Naveed S, Waqas A, Chaudhary AMD, Kumar S, Abbas N, Amin R, Jamil N, Saleem S

Prevalence of Common Mental Disorders in South Asia: A Systematic Review and Meta-Regression Analysis

Frontiers in Psychiatry 2020; 11: 573150

View review abstract online

Comparison	**10-year prevalence rate of PTSD in South Asia (India, Pakistan, Nepal, Sri Lanka, and Bangladesh).**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, appears imprecise, direct) finds the 10-year prevalence of PTSD in South Asia is around 17%.**
PTSD	
The 10-year prevalence of PTSD in South Asia is around 17%; 21 studies, N = 42,298, 10-year prevalence = 17.2%, 95%CI 11% to 25.9%, I^2 = 99%	
Consistency in results	Inconsistent
Precision in results	Appears imprecise
Directness of results	Direct

Zuberi A, Waqas A, Naveed S, Hossain MM, Rahman A, Saeed K, Fuhr, D. C.

Prevalence of Mental Disorders in the WHO Eastern Mediterranean Region: A Systematic Review and Meta-Analysis

Frontiers in Psychiatry 2021; 12: 665019

View review abstract online

Comparison	**Prevalence of PTSD in the WHO Eastern Mediterranean region (Iran, Pakistan, Egypt, Lebanon, Sudan, Saudi Arabia, Morocco, Iraq, Afghanistan, Jordan, Qatar, Bahrain, Palestine, United Arab Emirates, and Tunisia).**

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Summary of evidence	**Moderate quality evidence (large sample, inconsistent, appears imprecise, direct) finds the pooled prevalence of PTSD in the Eastern Mediterranean region is around 7%. Current prevalence is around 9.5%, and lifetime prevalence is around 3.3% in this region.**
PTSD	
The prevalence of PTSD in the WHO Eastern Mediterranean is around 7%; Pooled prevalence: 14 studies, N = 58,567, point prevalence = 7.2%, 95%CI 2.9% to 16.6%, I^2 = 99% Current prevalence: 11 studies, N not reported, prevalence = 9.5%, 95%CI 4.2% to 20.1%, I^2 = 99% Lifetime prevalence: 4 studies, N not reported, prevalence = 3.3%, 95%CI 0.8% to 12.9%, I^2 = 99% There was significantly higher pooled prevalence of PTSD in low-income and lower GDP countries vs. high-income and higher GDP countries, and in trauma-exposed populations vs. the general population. There were no significant differences in rates across countries or across screening vs. diagnostic tools. There were no associations between rates and mean study age.	
Consistency in results	Inconsistent
Precision in results	Appears imprecise
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

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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].

† 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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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. Koenen KC, Ratanatharathorn A, Ng L, McLaughlin KA, Bromet EJ, Stein DJ*, et al.* (2017): Posttraumatic stress disorder in the World Mental Health Surveys. *Psychological Medicine* 47: 2260-74.
4. Naveed S, Waqas A, Chaudhary AMD, Kumar S, Abbas N, Amin R*, et al.* (2020): Prevalence of Common Mental Disorders in South Asia: A Systematic Review and Meta-Regression Analysis. *Frontiers in Psychiatry* 11: 573150.
5. Zuberi A, Waqas A, Naveed S, Hossain MM, Rahman A, Saeed K*, et al.* (2021): Prevalence of Mental Disorders in the WHO Eastern Mediterranean Region: A Systematic Review and Meta-Analysis. *Frontiers in Psychiatry* 12 (no pagination).
6. CochraneCollaboration (2008): Cochrane Handbook for Systematic Reviews of Interventions. Accessed 24/06/2011.
7. Rosenthal JA (1996): Qualitative Descriptors of Strength of Association and Effect Size. *Journal of Social Service Research* 21: 37-59.
8. GRADEpro (2008): [Computer program]. Jan Brozek, Andrew Oxman, Holger Schünemann. *Version 32 for Windows*