TECHNICAL COMMENTARY

Homeless populations

Introduction

Prevalence quantifies the proportion of individuals in a population who have a disease during a specific time-period. Many studies have reported a high prevalence of various health problems, including mental health problems, among homeless people. However, the rate of bipolar disorder in this population may be difficult to measure due to diversity between studies in the definitions of homelessness and the diagnostic criteria used.

Method

We have included only systematic reviews with detailed literature search, methodology, and inclusion/exclusion criteria that were published in full text, in English, from the year 2010. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. Reviews with pooled data are prioritized for inclusion. Reviews reporting fewer than 50% of items on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA[1]) checklist have been excluded from the library. The evidence was graded guided by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group approach[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 two systematic reviews that met our inclusion criteria[3, 4].

- Moderate quality evidence finds the prevalence of bipolar disorder in homeless people is around 11.4%. Rates were lowest in high-income countries (4%) and were similar across diagnostic instruments used.

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Ayano G, Shumet S, Tesfaw G, Tsegay L

A systematic review and meta-analysis of the prevalence of bipolar disorder among homeless people

BMC Public Health 2020; 20: 731

View review abstract online

Comparison	**Prevalence of bipolar disorder in homeless people.**
Summary of evidence	**Moderate quality evidence (large sample, inconsistent, appears imprecise, direct) finds the prevalence of bipolar disorder in homeless people is around 11.4%. Rates were similar in Europe compared to other countries and were similar across diagnostic instruments.**
Prevalence of bipolar disorder	
10 studies, N = 4,300, prevalence = 11.4%, 95%CI 7.5% to 16.9%, I^2 = 94% European studies and studies from other countries reported similar prevalence rates (10% and 13.2% respectively). The rates were similar according to DSM diagnosis or other instruments (DSM = 11.5%, MINI, SCAN, or CIDI = 11%).	
Consistency in results‡	Inconsistent
Precision in results§	Appears imprecise
Directness of results‖	Direct

Gutwinski S, Schreiter S, Deutscher K, Fazel S

The prevalence of mental disorders among homeless people in high-income countries: An updated systematic review and meta-regression analysis

PLoS Medicine 2021; 18(8) e1003750

View review abstract online

Comparison	**Prevalence of bipolar disorders in homeless populations in high-income countries.**

Homeless populations

Summary of evidence	**Moderate to high quality evidence (large sample, inconsistent, appears precise, direct) suggests the prevalence of bipolar disorders in homeless populations in high-income countries is around 4%.**
Prevalence of bipolar disorder	
14 studies, N not reported, prevalence = 4.1%, 95%CI 2% to 6.7%, I^2 = 89% Univariable regression models indicated that studies with higher proportions of female participants reported significantly higher rates of bipolar disorder.	
Consistency in results	Inconsistent
Precision in results	Appears precise
Directness of results	Direct

Explanation of acronyms

CI = confidence interval, CIDI = Composite International Neuropsychiatric Interview, DSM = Diagnostic Statistical Manual of Mental disorders, I^2 = measure of heterogeneity in study results, MINI = Mini-International Neuropsychiatric Interview, N = number of participants, SCAN = Schedule for Clinical Assessment of Neuropsychiatry

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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[5].

† 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. Standardized 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. 0.2 represents a small effect, 0.5 a medium effect, and 0.8 and over represents a large effect[5].

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[6]. 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 are an indication of prediction, but do not confirm causality due to

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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 treatment 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 substantial heterogeneity and over is considerable heterogeneity. I^2 can be calculated from Q (chi-square) for the test of heterogeneity with the following formula;

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

§ 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, this criteria should be relaxed[7].

‖ 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 so is 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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