TECHNICAL COMMENTARY

Eating disorders

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BIPOLAR DISORDERS LIBRARY

Introduction

Eating disorders include anorexia nervosa, which involves a lack of maintaining normal weight, usually less than 85% of the expected weight, and an intense fear of gaining weight. Bulimia nervosa involves the presence of binge eating followed by compensatory behaviours to prevent weight gain, while binge eating disorder does not involve compensatory behaviour.

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 a diagnosis of bipolar or related disorders. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. Hand searching reference lists of identified reviews was also conducted. When multiple copies of review topics were found, only the most recent and/or comprehensive review was included. Reviews with pooled data were prioritised 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. The PRISMA flow diagram is a suggested way of providing information about studies included and excluded with reasons for exclusion. Where no flow diagram has been presented by individual reviews, but identified studies have been described in the text, reviews have been checked for this item. 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 two systematic reviews that met our inclusion criteria[3, 4].

- Moderate quality evidence finds the prevalence of any eating disorder in people with bipolar disorder is around 13%. The prevalence of binge eating disorder is around 12.5%, bulimia nervosa is around 7%, and anorexia nervosa is around 2.5%. Overall, prevalence rates of eating disorders were highest in females with bipolar disorder, and in people with bipolar II disorder.

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Alvarez Ruiz EM, Gutierrez-Rojas L

Comorbidity of bipolar disorder and eating disorders

Revista de Psiquiatria y Salud Mental 2015; 8: 232-41

View review abstract online

Comparison	**Eating disorders in people with bipolar disorder.**
Summary of evidence	**Moderate to low quality evidence (mixed sample sizes, appears inconsistent, unable to assess precision, direct) suggests the overall prevalence of eating disorders in people with bipolar disorder ranges between 3% and 36%. Binge eating disorders appear to be more prevalent (9% to 29%) than anorexia nervosa (3% to 26%) or bulimia nervosa (2% to 10%).**

Eating disorders

Any eating disorder

Between ~5% and ~36% of people with bipolar disorder had any eating disorder;

1 study, N = 356 people with bipolar I or II disorder found 5.3% had an eating disorder.

1 study, N = 64 people with bipolar I or II disorder found 7.3% had an eating disorder.

1 study, N = 2,548 people with hypomania or major depressive disorder found 8% of patients with mania had had an eating disorder at some time.

1 study, N = 810 women with bipolar I or II disorder found 26% had a full eating disorder and 22% had a partial eating disorder.

1 study, N = 72 people with bipolar I or II disorder found 36% had an eating disorder.

Binge eating disorder

Between ~9% and ~29% of people with bipolar disorder had a binge eating disorder;

1 study, N = 139 people with bipolar I or II disorder found 8.6% had a binge eating disorder.

1 study, N = 875 people with bipolar I or II disorder found 8.8% had a binge eating disorder.

1 study, N = 717 people with bipolar I or II disorder found 9.5% had a binge eating disorder.

1 study, N = 81 people with bipolar I or II disorder found 11.1% had a binge eating disorder.

1 study, N = 61 people with bipolar I or II disorder found 13.1% had a binge eating disorder, 37.7% had current binge eating episodes.

1 study, N = 83 people with bipolar I or II disorder found 13.3% had a binge eating disorder and 12% had a partial binge eating disorder.

1 study, N = 148 women with bipolar I or II disorder found 14.2% had or had had a binge eating

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disorder. 1 study, N = 51 people with bipolar I or II disorder found 17.6% had a binge eating disorder. 1 study, N = 52 women with bipolar I or II disorder found 29% had a binge eating disorder. <u>Anorexia nervosa</u> *Between ~3% and ~16% of people with bipolar disorder had bulimia nervosa;* 1 study, N = 139 people with bipolar I or II disorder found 2.9% had anorexia nervosa. 1 study, N = 875 people with bipolar I or II disorder found 3.1% had anorexia nervosa. 1 study, N = 81 people with bipolar I or II disorder found 7.4% had anorexia nervosa. 1 study, N = 201 people with bipolar I or II disorder or major depression found 10.9% had anorexia nervosa. 1 study, N = 148 women with bipolar I or II disorder found 15.5% had or had had anorexia nervosa. <u>Bulimia nervosa</u> *Between ~2% and ~10% of people with bipolar disorder had bulimia nervosa;* 1 study, N = 129 people with bipolar I found 2.3% had bulimia nervosa. 1 study, N = 288 people with bipolar I or II disorder found 3.8% had bulimia nervosa. 1 study, N = 875 people with bipolar I or II disorder found 4.8% had bulimia nervosa. 1 study, N = 148 women with bipolar I or II disorder found 5.4% had or had had bulimia nervosa. 1 study, N = 139 people with bipolar I or II disorder found 6.5% had bulimia nervosa. 1 study, N = 81 people with bipolar I or II disorder found 8.6% had bulimia nervosa. 1 study, N = 51 people with bipolar I or II disorder found 9.8% had a binge eating disorder. 1 study, N = 201 people with bipolar I or II disorder or major depression found 10.4% had bulimia nervosa.

Consistency in results	Appears inconsistent.
Precision in results	Unable to assess; no CIs are reported.
Directness of results	Direct

Fornaro M, Daray FM, Hunter F, Anastasia A, Stubbs B, De Berardis D, Shin JI, Husain MI, Dragioti E, Fusar-Poli P, Solmi M, Berk M, Vieta E, Carvalho AF

The prevalence, odds and predictors of lifespan comorbid eating disorder among people with a primary diagnosis of bipolar disorders, and vice-

versa: Systematic review and meta-analysis

Journal of Affective Disorders Part A. 2021; 280: 409-31

View review abstract online

Comparison	**Eating disorders in people with bipolar disorder.**
Summary of evidence	**Moderate quality evidence (large samples, inconsistent, appears imprecise, direct) finds the prevalence of any eating disorder in people with bipolar disorder is around 13%. The prevalence of binge eating disorder is around 12.5%, bulimia nervosa is around 7%, and anorexia nervosa is around 2.5%. Overall, prevalence rates of eating disorders were highest in females with bipolar disorder, and in people with bipolar II disorder.**

Eating disorders

Any eating disorder

Prevalence of any eating disorder in people with bipolar disorder is around 13%;

10 studies, N = 4,856, prevalence = 12.7%, 95%CI 9.5% to 16.8%, I^2 = 91%

Adjusted for publication bias: 7 studies, N not reported, prevalence = 9.5%, 95%CI 7% to 13%

Higher prevalence rates of any eating disorders were found in samples with more females, and in samples with more people with bipolar II disorder. Lower prevalence rates were found in samples with more people with bipolar I disorder. There was no moderating effect of age.

Binge eating disorder

Prevalence of binge eating disorder in people with bipolar disorder is around 12.5%;

15 studies, N = 7,098, prevalence = 12.5%, 95%CI 9.4% to 16.6%, I^2 = 93%

Higher prevalence rates of binge eating disorders were found in samples with more females, older age of bipolar disorder onset, more obese people, more people with bipolar II disorder, in outpatient settings, in European studies, and in case-control studies. Lower prevalence rates were found in samples with more people with bipolar I disorder, more overweight (rather than obese) people, and in samples with more people with rapid cycling of bipolar disorder. There were no moderating effects of age, duration of bipolar disorder illness, and comorbid substance use disorders.

Prevalence of bipolar disorder in people with binge eating disorder is around 9%;

9 studies, N = 14,374, prevalence = 9.1%, 95%CI 3.3% to 22.6%, I^2 = 99%

Higher prevalence rates of bipolar disorder were found in European studies, and in case-control studies.

Anorexia nervosa

Prevalence of anorexia nervosa in people with bipolar disorder is around 2.5%;

15 studies, N = 6,207, prevalence = 2.5%, 95%CI 1.5% to 3%, I^2 = 87% Adjusted for publication bias: 10 studies, N not reported, prevalence = 3.8%, 95%CI 2% to 6% Higher prevalence rates of anorexia nervosa were found in samples with more females, older samples, samples with a younger age at onset of bipolar disorder, samples with more people with bipolar II disorder. Lower prevalence rates were found in samples with more people with bipolar I disorder, and samples with more rapid cycling of bipolar disorder. There were no moderating effects of duration of bipolar disorder illness or of comorbid substance use disorders. *Prevalence of bipolar disorder in people with anorexia nervosa is around 4%;* 7 studies, N = 13,456, prevalence = 3.8%, 95%CI 1.2% to 11.2%, I^2 = 97% Adjusted for publication bias: 5 studies, N not reported, prevalence = 2%, 95%CI 1% to 2% Higher prevalence rates of bipolar disorder were found in European studies, and in case-control studies. <u>Bulimia nervosa</u> *Prevalence of bulimia nervosa in people with bipolar disorder is around 7%;* 17 studies, N = 7,399, prevalence = 6.6%, 95%CI 4.8% to 8.8%, I^2 = 91% Adjusted for publication bias: 13 studies, N not reported, prevalence = 7.4%, 95%CI 6% to 10% Higher prevalence rates of bulimia nervosa were found in samples with more females, older samples, in samples with more people with bipolar I disorder, and more obese people, Lower prevalence rates were found in samples with longer duration of bipolar disorder illness, in samples with more people on antidepressants, and in samples with more suicidality. There were no moderating effects of age, bipolar II disorder, comorbid substance use disorders, and rapid cycling. *Prevalence of bipolar disorder in people with bulimia nervosa is around 11%;* 4 studies, N = 13,295, prevalence = 10.8%, 95%CI 1.7% to 45.3%, I^2 = 100% Adjusted for publication bias: 3 studies, N not reported, prevalence = 6.7%, 95%CI 1.2% to 29.2% Higher prevalence rates of bipolar disorder were found in Asian samples.

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, 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[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. 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[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

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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[5];

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

§ 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[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 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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