## The Prevalence and Correlates of Binge Eating Disorder in the World Health Organization World Mental Health Surveys

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**Background:** Little population-based data exist outside the United States on the epidemiology of binge eating disorder (BED). Crossnational BED data are presented here and compared with bulimia nervosa (BN) data in the World Health Organization (WHO) World Mental Health Surveys.

**Methods:** Community surveys with 24,124 respondents (ages 18+) across 14 mostly upper-middle and high-income countries assessed lifetime and 12-month DSM-IV mental disorders with the WHO Composite International Diagnostic Interview. Physical disorders were assessed with a chronic conditions checklist.

**Results:** Country-specific lifetime prevalence estimates are consistently (median; interquartile range) higher for BED (1.4%; .8–1.9%) than BN (.8%; .4–1.0%). Median age of onset is in the late teens to early 20s for both disorders but slightly younger for BN. Persistence is slightly higher for BN (6.5 years; 2.2–15.4) than BED (4.3 years; 1.0–11.7). Lifetime risk of both disorders is elevated for women and recent cohorts. Retrospective reports suggest that comorbid DSM-IV disorders predict subsequent onset of BN somewhat more strongly than BED and that BN predicts subsequent comorbid disorders somewhat more strongly than does BED. Significant comorbidities with physical conditions are due almost entirely to BN and to a somewhat lesser degree BED predicting subsequent onset of these conditions. Role impairments are similar for BN and BED. Fewer than half of lifetime BN or BED cases receive treatment.

**Conclusions:** Binge eating disorder represents a public health problem at least equal to BN. Low treatment rates highlight the clinical importance of questioning patients about eating problems even when not included among presenting complaints.

**Key Words:** Binge eating disorder, bulimia nervosa, comorbidity, epidemiology, treatment, WHO World Mental Health Surveys

The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (1) recognizes only two specific eating disorders, anorexia nervosa and bulimia nervosa (BN). A provisional third diagnosis, binge eating disorder (BED), is characterized by recurrent-persistent episodes of uncontrolled binge eating with distress but without the inappropriate compensatory behaviors of BN. Based on growing evidence of comparatively high prevalence and clinical significance (2), a call has been made to include BED as a diagnosis in DSM-5 (3,4). However, most current BED epidemiological data come from Western samples (3,5,6). This report extends these data by examining the epidemiology of BED in 14 countries. To address concerns that BED may be

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Received Jul 3, 2012; revised and accepted Nov 21, 2012.

insufficiently distinct from BN, we analyze BED and BN in tandem.

## **Methods and Materials**

## Samples

Data come from the World Health Organization World Mental Health (WMH) Survey Initiative (7). The 14 countries in WMH that assessed BED include 1 with a World Bank (8) classification as lowermiddle income (Colombia), 3 with a classification as upper-middle income (Brazil, Mexico, Romania), and 10 with a classification as high income (Belgium, France, Germany, Italy, The Netherlands, New Zealand, Northern Ireland, Portugal, Spain, and the United States). All surveys used adult household probability samples that were either nationally representative (all but three countries), representative of all urbanized areas (Colombia, Mexico), or representative of one urbanized area (São Paulo, Brazil). Sample sizes ranged from 466 (France) to 7312 (New Zealand) and totaled 24, 124. Response rates ranged from 45.9% to 87.7% and averaged 68.8%. More details about WMH samples are reported elsewhere (9).

Interviews had two parts. Part I, administered to all respondents, assessed core mental disorders (see below). All part I respondents with any core disorder plus a probability subsample of other part I respondents were then administered part II, which assessed correlates and noncore disorders. Eating disorders were in part II. The eating disorder subsamples were weighted for undersampling noncases and for sociodemographic/geographic discrepancies with the population.

### Measurement

**Interviews.** Interviews were administered face-to-face using consistent training and field quality control procedures (7,10,11). Informed consent procedures were approved by the Institutional Review Boards of collaborating organizations. The instrument was the fully structured, lay-administered World Health Organization Composite International Diagnostic Interview (CIDI) (12). Composite International Diagnostic Interview translation, back-translation, and harmonization used standardized procedures (10).

BN and BED. The diagnostic algorithms and CIDI guestions for DSM-IV BN and BED are presented in Supplement 1. Symptom questions closely parallel DSM-IV criteria with two exceptions. First, whereas DSM-IV BED requires 6 months of regular binge eating, the CIDI asked only about 3 months. However, this duration is consistent both with proposed DSM-5 criteria (3,13,14) and with DSM-IV BN criteria (15). Second, DSM-IV requires loss of control and distress regarding binges. Rather than address these symptoms directly, the CIDI questioned about attitudes and behaviors indicative of loss of control and distress (upset at out-of-control eating; feeling guilty, upset, or depressed after binging; continued eating after full; eating until uncomfortably full; eating alone because of embarrassment about volume eaten), introducing some imprecision into these assessments. DSM-IV diagnostic hierarchy rules do not allow BN or BED diagnoses in the presence of anorexia nervosa or BED in the presence of BN. These hierarchy rules were implemented with retrospective age-of-onset (AOO) reports based on probing methods found to improve dating accuracy (16).

Respondents with lifetime BN or BED were asked if they ever received treatment for eating problems. Respondents with 12month disorders were additionally asked about 12-month treatment and administered a modified version of the Sheehan Disability Scales (SDS) (17) to assess severity of recent eating problems. The modified SDS uses a 0 to 10 visual analogue scale from none (0) to very severe (10) to characterize severity of impairment in each of four areas of living (work, home management, social life, close relationships). The SDS has excellent internal consistency reliability (17–19) and good concordance with objective measures of role functioning (17–21). Height and weight were also assessed by self-report.

Other DSM-IV Disorders. Fourteen other DSM-IV/CIDI disorders considered here include mood disorders (major depressive/ dysthymia, bipolar I-II), anxiety disorders (panic disorder with/without agoraphobia, specific phobia, social phobia, generalized anxiety, posttraumatic stress, separation anxiety), disruptive behavior disorders (attention-deficit/hyperactivity, oppositional-defiant, conduct, and intermittent explosive), and substance disorders (alcohol and drug abuse with or without dependence). Diagnostic hierarchy rules and organic exclusion rules were used in all diagnoses except oppositional-defiant disorder (diagnosed with/without conduct disorder) and substance abuse (diagnosed with/without dependence). Age of onset was assessed using the same probing method as for eating disorders (16). A blinded clinical reappraisal study using the Structured Clinical Interview for DSM-IV (22) in four WMH surveys found generally good concordance between CIDI and Structured Clinical Interview for DSM-IV diagnoses (23).

**Chronic Physical Conditions.** Comorbidities were also examined with 15 lifetime chronic physical conditions assessed using a checklist based on the US National Health Interview Survey (24,25). Age of onset was also assessed, allowing study of time-lagged associations with eating disorders. The checklist asked respondents whether they ever had a series of symptom-based conditions (e.g., chronic headaches) and whether a health professional ever said they had a series of silent conditions (e.g., hypertension). Such checklists yield more complete and accurate reports than reports from open-ended questions (26) and have good concordance with medical records (27–29).

**Treatment.** In addition to questions about treatment of eating disorders, respondents were asked if they saw a series of professionals "for problems with your emotions, nerves, or your use of alcohol or drugs" ever or in the past 12 months. These reports were not validated against treatment records. Treatment was divided into four sectors: specialty, general medical, human services, and complementary-alternative.

## **Statistical Analyses**

Cross-tabulations were used to estimate prevalence, persistence, and treatment. The actuarial method (30) was used to generate AOO and persistence curves. Discrete-time survival analysis with a logistic link function and person-year as the unit of analysis (31) was used to estimate predictors of onset and persistence. Survival coefficients and standard errors were exponentiated to create odds ratios (ORs) with 95% confidence intervals. Design-based standard errors were estimated with the Taylor series method (30) using the SUDAAN software system (Research Triangle Institute, Research Triangle Park, North Carolina) (32). Multivariate significance was evaluated using Wald  $\chi^2$  tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was consistently evaluated using two-sided .05-level tests.

#### Results

#### Prevalence

Lifetime prevalence estimates average 1.0% for BN and 1.9% for BED across surveys. Range and interquartile range (IQR) (25th–75th percentiles) of lifetime prevalence estimates across surveys

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