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William D. Ellison
Trinity University, wellison@trinity.edu

Lia Rosenstein

T. A. Morgan

Mark Zimmerman

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William D. Ellison, PhD (corresponding author),[1] Lia Rosenstein,[2] Theresa A. Morgan, PhD,[3] and Mark Zimmerman, MD[4]

Synopsis: Several studies of the prevalence of Borderline Personality Disorder (BPD) in community and clinical settings have been carried out to date. Although results vary according to sampling method and assessment method, median point prevalence of BPD is roughly 1%, with higher or lower rates in certain community subpopulations. In clinical settings, BPD prevalence is around 10-12% in outpatient psychiatric clinics and 20-22% among inpatient clinics. Further research is needed to identify the prevalence and correlates of BPD in other clinical settings (e.g., primary care) and to investigate the impact of demographic variables on BPD prevalence.

Keywords: Borderline Personality Disorder; prevalence; epidemiology; diagnosis

Key Points:

1. Point prevalence of BPD is roughly 1% in community settings.
2. Point prevalence of BPD in clinical settings is approximately 12% in outpatient psychiatric clinics and 22% in inpatient psychiatric clinics.
3. Prevalence estimates of BPD depend greatly on the use of standardized, validated methods for diagnosis; unstandardized or informal methods tend to underdiagnose BPD.
4. Prevalence of BPD varies according to certain demographic factors, such as age; more research is needed into the demographic correlates of the disorder.

[1] From the Department of Psychology, Trinity University. Email: wellison@trinity.edu. Mailing address: One Trinity Place, San Antonio, TX 78212.
[2] From the Department of Psychology, Pennsylvania State University. Email: lkr6@psu.edu. Mailing address: 140 Moore Building, University Park, PA 16801.
[3] From the Department of Psychiatry, Warren Alpert Medical School of Brown University and Department of Psychiatry, Rhode Island Hospital. Email: tmorgan3@lifespan.org. Mailing address: 593 Eddy Street, Providence, RI 02903.
[4] From the Department of Psychiatry, Warren Alpert Medical School of Brown University and Department of Psychiatry, Rhode Island Hospital. Email: mzimmerman@lifespan.org. Mailing address: 146 West River St., Ste 11B, Providence, RI 02904

Community and Clinical Epidemiology of Borderline Personality Disorder

This paper concerns the community and clinical epidemiology of Borderline Personality Disorder (BPD) – its prevalence and characteristics in different community and treatment settings and among different populations of individuals. We focus on a categorically defined BPD entity, even if the exact definition varies across different diagnostic systems. Nevertheless, there is compelling evidence that BPD is not a discrete condition that pertains to a class of individuals (alongside another, complementary "healthy" class) but instead a dimensionally distributed construct. Taxometric studies using different operationalizations of BPD and conducted among different populations largely agree on this point,[1-4] as does a comparison of the fit of categorical and dimensional models of the latent structure of BPD.[5] On the other hand, the distribution of dimensionally defined borderline pathology is inadequately understood, and the extant large-scale research has generally assumed a categorical model for BPD. Therefore, the current review will focus on the epidemiology of the categorically defined BPD syndrome.

We also wish to highlight the importance of measurement for estimates of BPD prevalence, as studies suggest that clinicians who do not use a dedicated assessment tool to screen for, or diagnose, BPD tend to neglect the diagnosis. For example, Zimmerman & Mattia[6] found that clinicians left to their own judgments diagnosed BPD in only 0.4% of outpatients, compared to 14.4% by structured interview (a rate much more consistent with established outpatient prevalence rates of BPD). Simply providing results of positive BPD diagnoses to intake clinicians who had not used the interview themselves raised the diagnosis rate of BPD to 7%, suggesting the clinical utility of this information and the extent to which it can be neglected in routine practice. Likewise, Comtois and Carmel[7] compared BPD diagnoses produced by routine clinical records and diagnoses from semi-structured research interviews among

outpatients in a public mental health service. They found that the interviews identified BPD in 15.1% of patients, whereas this diagnosis appeared in records 6.9% of the time. Even when clinicians have the information necessary to make a BPD diagnosis, they often miss it. Hillman, Stricker, & Zweig[8] presented clinical vignettes describing individuals with major depression only, or major depression with comorbid BPD, to 186 experienced psychologists. Only 14% of respondents correctly made a BPD diagnosis when it was warranted.

Because of this discrepancy, when estimating community prevalence, we will focus on epidemiological studies using a well-validated instrument for diagnosing BPD, although there are some notable exceptions (described below) in which a validated instrument was not used but its prevalence was estimated systematically at a later date. However, for clinical prevalence, we will review both BPD prevalence estimates derived from a BPD-specific diagnostic measure and those estimates derived from unstructured clinical assessment, and we will highlight several additional studies that illustrate the importance of assessing for BPD in clinical settings.

Major Epidemiological Studies of BPD in the Community: United States

In the United States, several large epidemiological studies assessing BPD have been conducted since the introduction of the *DSM-III* criteria for the disorder. Table 1 shows the prevalence rates obtained from each of these studies. The first of these was the National Institute of Mental Health's Epidemiologic Catchment Area studies (ECA).[9] The ECA studies collected interviews from over 18,000 adult individuals across five catchment areas (New Haven, Baltimore, St. Louis, central North Carolina, and Los Angeles), oversampling elderly, Black, and Hispanic respondents. The NIMH Diagnostic Interview Schedule (DIS), a structured interview, provided information about DSM-III disorders. However, the only personality disorder directly assessed during this effort was antisocial PD. Despite the fact that BPD was not directly assessed

in the ECA studies themselves, three later studies attempted to derive BPD prevalence estimates from ECA respondents. Swartz and colleagues[10] used an empirically-derived algorithm relating DIS symptoms to items from the Diagnostic Interview for Borderlines (DIB) to estimate the prevalence of BPD in respondents from Wave II of the North Carolina site ECA study. Separately, Samuels and colleagues[11] followed 810 individuals from the Baltimore site who were selected for "clinical reappraisal" by psychiatrists. The reappraisals used a semistructured diagnostic instrument (the Standard Psychiatric Examination) that was not designed to diagnose *DSM-III* personality disorders but rather general psychiatric symptoms, history, and functioning. Information about BPD was later coded from these interviews. Finally, Samuels and colleagues[12] reported on the prevalence of BPD among 742 individuals from the Baltimore ECA follow-up survey,[13] some of whom were among those examined by psychiatrists in the original ECA clinical reappraisal. (Other respondents in Samuels et al.'s sample had a lifetime diagnosis of one of six Axis I disorders at follow-up or were drawn randomly from the remaining ECA respondents.) These individuals were diagnosed via the International Personality Disorder Examination (IPDE).

The National Comorbidity Survey (NCS)[14] provided an update of the ECA findings using *DSM-III-R* criteria rather than those of *DSM-III* based on a stratified probability sample of individuals in the continental United States rather than a set of discrete catchment areas. Diagnoses were made using the World Health Organization's Composite International Diagnostic Interview (CIDI), which was based on the DIS and, like its predecessor, was fully structured so that it could be used by lay interviewers. However, also like the ECA studies, the battery used in the NCS only included antisocial PD from among the *DSM-III-R* personality disorders, and no estimate of the prevalence of BPD in the NCS data has been made to date.

Crawford and colleagues[15] reported on the prevalence of personality disorders among 644 adult residents of two upstate New York counties who were screened as part of the longitudinal Children in the Community Study. Screening instruments were the Children in the Community-Self Report scales (CIC-SR) and the screener accompanying the Structured Clinical Interview for *DSM-IV* Axis II (SCID-II), the SCID-II-PQ. The SCID-II was then administered in an abbreviated fashion, omitting follow-up questions for those respondents who did not endorse enough screening questions to warrant further inquiry. The stability of BPD in the study cohort, as well as the cumulative prevalence for BPD from age 14 to age 33, are also available in separate reports.[16-18]

The National Comorbidity Survey Replication (NCS-R)[19] aimed to update the state of knowledge about the epidemiology of mental disorders in the United States, using *DSM-IV* criteria and an expanded list of assessed diagnoses. Importantly for BPD, the NCS-R assessed personality disorders with the IPDE Screening Questionnaire and the IPDE itself for individuals screening positive. 9282 adults received face-to-face interviews between 2001 and 2003. Lenzenweger and colleagues[20] reported on 12-month BPD prevalence in a probability subsample of 214 respondents who received a "clinical reappraisal" interview. This subsample over-sampled those who screened positive for one of the "core" clinical disorders but also included some individuals who did not screen positive.

The National Epidemiological Survey on Alcohol and Related Conditions (NESARC) is a community-based survey of adults from all 50 U.S. states and the District of Columbia. Face-to-face interviews were conducted with over forty thousand respondents by census workers with minimal experience, who used an unvalidated Axis II diagnostic instrument, the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV (AUDADIS-IV). Lifetime

BPD was assessed at Wave 2 of the study,[21] which involved re-interviews of Wave 1 respondents (34,653 of 43,093 Wave 1 respondents gave re-interviews, or 86.7%). Importantly, Grant and colleagues gave a lifetime BPD diagnosis if sufficient BPD symptoms were present and at least one symptom was associated with significant distress, impairment or dysfunction. This method resulted in a lifetime prevalence estimate of 5.9%. However, some authors criticized this report as being overly inclusive, and resulting in exaggerated PD prevalence estimates. Trull, Jahng, Tomko, Wood and Sher[22] revised the original NESARC scoring to require significant distress or impairment be present to count each PD criterion individually, rather than cumulatively. The authors then applied this revision to original NESARC algorithms, reporting a revised prevalence rate of 2.7%.

Major Epidemiological Studies of BPD in non-US Communities

Several studies of BPD prevalence in communities outside the United States have also been conducted. For example, Torgersen, Kringlen, and Cramer[23] sampled individuals from the National Register of Oslo, Norway. Personality disorders were assessed with the SIDP-R, which was administered by nurses, medical students, and lay interviewers. Of the 3590 individuals selected for inclusion, 2053 (57%) were interviewed.

Coid and colleagues[24] reported results of a national survey of adult community members in England, Wales, and Scotland. Initial screening for personality disorders was conducted under the British National Survey of Psychiatric Morbidity, which used computer-assisted interviews. Subsamples of the individuals screening positive in stage 1 for psychosis or a personality disorder, as well as a subsample screening negative for all disorders, were offered follow-up interviews. The stage 1 screening sample consisted of 8886 adults, of whom 628 individuals completed a follow-up interview with the SCID-II.

Zanarini and colleagues[25] reported on a survey of a cohort of 11-year-old community participants in Bristol, England, who were part of the Avon Longitudinal Study of Parents and Children (ALSPAC). These children were interviewed with the UK Childhood Interview for *DSM-IV* Borderline Personality Disorder (UK-CI-BPD), which was based on the Diagnostic Interview for *DSM-IV* Personality Disorders (DIPD-IV) but has modified language, content, and structure to accommodate juvenile respondents. 6,330 children gave complete interviews.

Finally, ten Have and colleagues[26] reported on BPD prevalence among adults in the Netherlands, using a sample from the Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2). Like the British National Survey of Psychiatric Morbidity,[24] an initial stage of computer-assisted interviews was conducted on a probability sample of individuals (n = 6646). However, unlike that study, all respondents from this initial wave were approached for a follow-up interview including the eight BPD items from the IPDE, which were incorporated into the CIDI. 5,303 individuals were included in the second-wave sample.

Community Subpopulations: BPD Prevalence in Adolescents and Older Adults

Despite evidence that BPD emerges in adolescence, it has typically been thought of as an adult disorder. There has been resistance to diagnose it before the age of 18 on the basis that personality has yet to solidify and that instability in identity and relationships is part of normative development. However, due to the seriousness of the disorder and marked burden on not only the individual but on the health care system, research efforts have shifted to focus on early detection and prevention.[27-28] These efforts parallel several recent findings that the BPD diagnosis can indeed be made in adolescents with adequate reliability, stability, and validity.[29-30]

A systematic review[31] found that rates of BPD in adolescent samples varied substantially depending on study design and sample characteristics but overall tended to be higher than adult

samples. For example, Levy and colleagues[32] found rates of BPD to be 43% in an adolescent inpatient unit (mean age 15.5). Similar results were found by Grilo and colleagues,[33] with BPD prevalence rates of 49% in adolescent inpatients. Outside of inpatient settings, community and clinical prevalence rates of BPD in adolescents tend to look similar to adult cohorts,[20] with estimates ranging from 0.9%[34] to 3%[16] in community samples and 11% in outpatients.[35] Of note, while BPD tends to be more prevalent in adult women than adult men, this gender split is not apparent among adolescents.[31]

While research shows that some personality pathology is exacerbated across the lifespan, BPD has been found to decrease and even remit as individuals age.[36-37] A review of personality disorder prevalence in younger and older age groups found rates of BPD to be significantly lower in older adults as compared to younger adults.[38] For example, one study found a prevalence rate of 22% in a sample of young adults and a rate of 7% in an elderly sample.[39] Another study found a BPD prevalence rate of 1% in a community sample of 200 adults over the age of 60.[40] Finally, a recent report of personality disorders in a community sample of individuals aged 55 to 64 found a BPD prevalence rate of 0.4%.[41] It has been hypothesized that this decrease in prevalence is secondary to "burnout" in symptoms such as impulsivity or lost social connections and therefore less interpersonal instability.[36] A majority of the research on prevalence rates is cross-sectional in design and more longitudinal studies extending into later life are needed with regards to aging and prevalence of BPD.

Community Settings: University

An important community setting to consider when looking at diagnostic prevalence of any psychiatric disorder is universities. Given the high risk for suicide and comorbid disorders such as substance abuse, gaining estimates of BPD among university students is warranted. An

early estimate of BPD prevalence among college students comes from Lenzenweger and colleagues,[42] who applied a two-stage diagnostic procedure to a large sample of college students in Ithaca, New York involving the IPDE-SQ and the IPDE. This study uncovered a point prevalence of 1.3%, although follow-up studies highlighted striking differences in the trajectories of PD symptoms in this cohort over a four-year period.[43] This suggests that a BPD diagnosis may not be stable among undergraduates, perhaps due to their relative youth or the fact that they are generally high-functioning compared to other community populations. A recent meta-analysis found that reported rates of BPD among college samples ranged from as low as 0.5% to as high as 32.1%, likely reflecting the varying methodology among primary studies. Moreover, there was an average lifetime prevalence rate of 9.7% in this population, and BPD prevalence was significantly lower in Asian American college students than in other racial or ethnic groups. [44]

Community Settings: Forensic

Highly prevalent in community and clinical populations, research indicates that rates of BPD are higher still in forensic settings.[45-48] Black and colleagues[45] found a prevalence rate of 29.5% among a randomly selected sample of 220 individuals recently committed to prison. Within this sample, the prevalence of BPD in female offenders was more than twice the prevalence seen in male offenders (54.5% and 26.8% respectively). In a female inmate sample, Jordan and colleagues[47] found a similar overall BPD prevalence rate of 28%. In a small male prison sample, Davison, Leese, and Taylor[49] found a 45% rate of BPD using the SCID-II. Overall, research suggests that prevalence of BPD in a forensic setting falls between about 25% and 55%. Additional research is needed as to comorbidities and outcomes for individuals with BPD in prison settings.

Clinical Epidemiology of BPD: Psychiatric Care Settings

In comparison to the general community population, BPD is highly prevalent in various types of psychiatric settings.[50] Table 2 summarizes prevalence estimates of BPD in studies of psychiatric populations, focusing on samples that consist of consecutively admitted patients or other naturalistic groups. The mean prevalence rate of BPD among inpatient samples across these studies, weighted by sample size, is 22.4%, whereas the comparable mean for outpatient samples is 11.8%. As above, we wish to highlight the discrepancy in prevalence estimates derived from diagnostic practice "as usual" from those estimates derived through either a well-validated interview or a diagnostic process with deliberate attention to personality pathology. For example, Kantojärvi and colleagues' inpatient prevalence estimate of 5.6%, derived through review of hospital records,[51] is markedly lower than the inpatient average.

We also wish to highlight the Rhode Island Methods to Improve Diagnostic Assessment and Services (MIDAS) project, an ongoing study of diagnostic methods that has amassed a sample size of 3800 treatment-seeking outpatients.[52] To date, this is by far the largest outpatient sample to be diagnosed with semi-structured diagnostic interviews, and as such, it provides perhaps the best single estimate of the outpatient prevalence of BPD. The most up-to-date estimate of BPD prevalence from the MIDAS project found 390 individuals with BPD among 3674 individuals completing the SIDP-IV (10.6%).[53]

Clinical Settings: Primary Care

Whether an individual seeks consultation explicitly for their psychiatric symptoms or whether screened for psychopathology by their physician during routine medical practice, the gateway to psychiatric care for many individuals is through primary care providers. While there is substantial information on the epidemiology of depression and anxiety in primary care settings, little is known about the prevalence of BPD in such facilities. One problem is that

screening and assessment for BPD in primary care is lacking. For example, an examination of computerized databases of primary care records in the Catalan Health Institute in Spain[54] found a prevalence of recorded BPD of only 0.017%, much lower than the prevalence in the general population. This large discrepancy raises issues around screening for psychiatric disorders, particularly BPD in primary care samples given the high rates of medical comorbidities in this population. Likewise, a study in an urban primary care practice found that 42.9% of cases later identified to have BPD had not been recognized as having psychiatric difficulties of any kind by their primary care physicians.[55] Given the increased risk of suicide and impaired psychosocial functioning, the authors of this study argued that properly assessing BPD is vital to better predicting and preventing potential ruptures in treatment and foreseeing issues in the patient-physician relationship. Further epidemiological studies are needed with regards to BPD in primary care settings and behavioral medicine, with the ultimate goal of improving screening practices to help triage patients to appropriate treatment.

Clinical Settings: Non-Psychiatric Specialty Care

Reviews of the prevalence of BPD in medical settings suggest that individuals with BPD have been shown to be especially common among those presenting in medical settings with alcohol and substance use disorders, multiple somatic complains, chronic pain, obesity, sexual dysfunction (including sexual dissatisfaction and promiscuity), and trichotillomania.[56-57] This finding is essentially consistent with recent reviews documenting high levels of physical health problems among individuals with BPD.[58-59] It should be noted that the research basis for the connections between BPD and these physical complaints varies considerably in both quantity and quality; many primary studies used convenience samples rather than probability samples,

self-report measures or chart review rather than well-validated diagnostic interviews, or had excessively small sample sizes.

Further reviews and primary studies have identified other specialty medical settings where individuals with BPD can be found in large numbers, such as aesthetic plastic surgery (especially to repair scars from deliberate self-injury)[60] and bariatric surgery.[61] Many of the large-scale epidemiological studies reviewed above have also provided their own evidence that Borderline Personality Disorder is associated with a wide array of physical health conditions.[62-65] In short, there is suggestive to strong evidence to indicate that BPD is prevalent among individuals seeking care for a wide variety of physical health complaints.

Given that personality pathology frequently co-occurs with alcohol and drug addiction, high rates of BPD are seen in substance abuse clinics and programs. One study[66] surveyed 320 patients enrolled in an outpatient addictions service targeting alcohol and opiate dependence and found the prevalence rate of personality disorders to be 62.2%. While 0% of the sample met criteria for schizotypal personality disorder and 13.8% qualified for an antisocial personality disorder diagnosis, BPD had the highest prevalence of any specific personality disorder at 15%. The authors also reviewed principal studies in the literature regarding the prevalence of personality pathology in substance abusing samples and found that the rates of BPD varied substantially between 3.2%[67] and 65.1%.[68]

Summary and Areas in Need of Research

In sum, BPD is relatively common in the general population, with a point prevalence around 1%. There are also subpopulations in which the prevalence is higher (e.g., incarcerated individuals) or lower (e.g., elderly individuals) than this. The prevalence of BPD is substantially higher in clinical settings, around 12% in the outpatient psychiatric population and 22% among

inpatients. Although there are no well-established prevalence rates in primary care, there is reason to believe that BPD is quite common among individuals seeking medical care for a variety of physical conditions.

There are some areas in which the epidemiology of BPD would particularly benefit from additional research. For example, although extant studies of racial and ethnic differences in the community prevalence of BPD do not show systematic differences,[21,69] a recent review identified racial differences in BPD prevalence in more specific settings.[70] Research also suggests that there may be differences among ethnic groups in the prevalence and extent of many indicators of BPD, such as suicidality[71-72] and deliberate self-harm.[73] In addition, the association between deliberate self-harm and borderline personality features differs among ethnic groups,[74] and African-American individuals with BPD have been shown to report more affective instability and emotion dysregulation, but less suicidal behavior and deliberate self-harm, than White American individuals with the disorder.[75-76] Systematic studies of this topic are few, as are studies of the impact of other demographic variables (e.g. socioeconomic status) on BPD presentation and prevalence. Our knowledge of BPD's epidemiology would be strengthened with greater attention to these important issues.

References

1. Arntz A, Bernstein D, Gielen D, et al. Taxometric evidence for the dimensional structure of cluster-C, paranoid, and borderline personality disorders. J Pers Disord. 2009;23:606-628.
2. Edens JF, Marcus DK, Ruiz MA. Taxometric analyses of borderline personality features in a large-scale male and female offender sample. J Abnorm Psychol. 2008;117:705-711.
3. Rothschild L, Cleland C, Haslam N, Zimmerman M. A taxometric study of borderline personality disorder. J Abnorm Psychol. 2003;112:657-666.
4. Trull TJ, Widiger TA, Guthrie P. Categorical versus dimensional status of borderline personality disorder. J Abnorm Psychol. 1990;99:40-48.
5. Conway C, Hammen C, Brennan PA. A comparison of latent class, latent trait, and factor mixture models of DSM-IV borderline personality disorder criteria in a community setting: Implications for DSM-5. J Pers Disord. 2012;26:793-803.
6. Zimmerman M, Mattia J. Psychiatric diagnosis in clinical practice: Is comorbidity being missed? Compr Psychiatry. 1999;40:182-191.
7. Comtois KA, Carmel A. Borderline personality disorder and high utilization of inpatient psychiatric hospitalization: Concordance between research and clinical diagnosis. J Behav Health Serv Res. 2016;43:272-280.
8. Hillman JL, Stricker G, Zweig RA. Clinical psychologists' judgments of older adult patients with character pathology: Implications for practice. Prof Psychol Res Pr. 1997;28:179-183.

9. Regier DA, Boyd JH, Burke JD, et al. One-month prevalence of mental disorders in the United States: Based on five Epidemiologic Catchment Area sites. Arch Gen Psychiatry. 1988;45:977-986.

10. Swartz M, Blazer D, George L, Winfield I. Estimating the prevalence of borderline personality disorder in the community. J Pers Disord. 1990;4:257-272.

11. Samuels JF, Nestadt G, Romanoski AJ, Folstein, MF, McHugh PR. DSM-III personality disorders in the community. Am J Psychiatry. 1994;151:1055-1062.

12. Samuels J, Eaton WW, Bienvenu J, Brown CH, Costa PT, Nestadt G. Prevalence and correlates of personality disorders in a community sample. Br J Psychiatry. 2002;180:536-542.

13. Eaton WW, Anthony JC, Gallo J, et al. Natural history of Diagnostic Interview Schedule/DSM-IV major depression: The Baltimore Epidemiologic Catchment Area Follow-Up. Arch Gen Psychiatry. 1997;54:993-999.

14. Kessler RC, McGonagle KA, Zhao S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. Arch Gen Psychiatry. 1994;51:8-19.

15. Crawford TN, Cohen P, Johnson JG, et al. Self-reported personality disorder in the Children in the Community sample: Convergent and prospective validity in late adolescence and adulthood. J Pers Disord. 2005;19:30-52.

16. Bernstein DP, Cohen P, Velez N, Schwab-Stone M, Siever LJ, Shinsato L. Prevalence and stability of the DSM-III-R personality disorders in a community-based sample of adolescents. Am J Psychiatry. 1993;150:1237-1243.

17. Johnson JG, Cohen P, Kasen S, Skodol AE, Hamagami F, Brook JS. Age-related change in personality disorder trait levels between early adolescence and adulthood: A community-based longitudinal investigation. Acta Psychiatr Scand. 2000;102:265-273.

18. Johnson JG, Cohen P, Kasen S, Skodol AE, Oldham JM. Cumulative prevalence of personality disorders between adolescence and adulthood. Acta Psychiatr Scand. 2008;118:410-413.

19. Kessler RC, Merikangas KR. The National Comorbidity Survey Replication (NCS-R): Background and aims. Int J Methods Psychiatr Res. 2004;13:60-68.

20. Lenzenweger MF, Lane MC, Loranger AW, Kessler RC. DSM-IV personality disorders in the National Comorbidity Survey Replication. Biol Psychiatry. 2007;62:553-564.

21. Grant BF, Chou SP, Goldstein RB, et al. Prevalence, correlates, disability, and comorbidity of DSM-IV borderline personality disorder: Results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. J Clin Psychiatry. 2008;69:533-545.

22. Trull TJ, Jahng S, Tomko RL, Wood PK, Sher KJ. Revised NESARC personality disorder diagnosis: Gender, prevalence, and comorbidity with substance dependence disorders. J Pers Disord. 2010;24:412-426.

23. Torgersen S, Kringlen E, Cramer V. The prevalence of personality disorders in a community sample. Arch Gen Psychiatry. 2001;58:590-596.

24. Coid J, Yang M, Tyrer P, Roberts A, Ullrich S. Prevalence and correlates of personality disorder in Great Britain. Br J Psychiatry. 2006;188:423-431.

25. Zanarini MC, Horwood J, Wolke D, Waylen A, Fitzmaurice G, Grant BF. Prevalence of DSM-IV borderline personality disorder in two community samples: 6,330 English 11-year-olds and 34,653 American adults. J Pers Disord. 2011;25:607-619.

26. ten Have M, Verheul R, Kaasenbrood A, et al. Prevalence rates of borderline personality disorder symptoms: A study based on the Netherlands Mental Health Survey and Incidence Study-2. BMC Psychiatry. 2016;16:249. doi:10.1186/s12888-016-0939-x

27. Chanen AM, Thompson K. Preventive strategies for borderline personality disorder in adolescents. Curr Treat Options Psychiatry. 2014;1:358-368.

28. Sharp C, Fonagy P. Practitioner review: Borderline personality disorder in adolescence – Recent conceptualization, intervention, and implications for clinical practice. J Child Psychol Psychiatry. 2015;56:1266-1288.

29. Kaess M, Brunner R, Chanen A. Borderline personality disorder in adolescence. Pediatrics. 2014;134:782-793.

30. Miller AL, Muehlenkamp JJ, Jacobson CM. Fact or fiction: Diagnosing borderline personality disorder in adolescents. Clin Psychol Rev. 2008;28:969-981.

31. Sharp C, Romero C. Borderline personality disorder: A comparison between children and adults. Bull Menninger Clin. 2007;71:85-114.

32. Levy KN, Becker DF, Grilo CM, et al. Concurrent and predictive validity of the personality disorder diagnosis in adolescent inpatients. Am J Psychiatry. 1999;156:1522-1528.

33. Grilo CM, McGlashan TH, Quinlan DM, Walker ML, Greenfeld D, Edell WS. Frequency of personality disorders in two age cohorts of psychiatric inpatients. Am J Psychiatry. 1998;155:140-142.

34. Lewinsohn PM, Rohde P, Seeley JR, Klein DN. Axis II psychopathology as a function of axis I disorders in childhood and adolescence. J Am Acad Child Adolesc Psychiatry. 1997;36:1752-1759.

35. Chanen AM, Jackson HJ, McGorry PD, Allot KA, Clarkson V, Hok PY. Two-year stability of personality disorder in older adolescent outpatients. J Pers Disord. 2004;18:526-541.

36. Oltmanns TF, Balsis S. Personality disorders in later life: Questions about the measurement, course, and impact of disorders. Annu Rev Clin Psychol. 2011;7:321-349.

37. Paris J. Personality disorders over time: Precursors, course and outcome. J Pers Disord. 2003;17:479-488.

38. Balsis S, Zweig RA, Molinari V. Personality disorders in later life. In: Lichtenberg, PA, Mast BT, Carpenter BD, Loebach Wetherell J, editors. APA Handbook of Clinical Geropsychology (vol 2). Washington, DC: American Psychological Association; 2015. p. 79-94.

39. Molinari V, Ames A, Essa M. Prevalence of personality disorders in two geropsychiatric inpatient units. J Geriatr Psychiatry Neurol. 1994;7:209-215.

40. Ames A, Molinari V. Prevalence of personality disorders in community-living elderly. J Geriatr Psychiatry Neurol. 1994;7:189-194.

41. Oltmanns TF, Rodrigues MM, Weinstein Y, Gleason MEJ. Prevalence of personality disorders at midlife in a community sample: Disorders and symptoms reflected in interview, self, and informant reports. J Psychopathol Behav Assess. 2014;36:177-188.

42. Lenzenweger MF, Loranger AW, Korfine L, Neff C. Detecting personality disorders in a nonclinical population: Application of a 2-stage procedure for case identification. Arch Gen Psychiatry. 1997;54:345-351.

43. Lenzenweger MF. The Longitudinal Study of Personality Disorders: History, design considerations, and initial findings. J Pers Disord. 2006;20:645-670.

44. Meaney R, Hasking P, Reupert A. Prevalence of borderline personality disorder in university samples: Systematic review, meta-anlaysis and meta-regression. PLoS One. 2016;11:e0155439. doi:10.1371/journal.pone.0155439

45. Black DW, Gunter T, Allen J, et al. Borderline personality disorder in male and female offenders newly committed to prison. Compr Psychiatry. 2007;48:400-405.

46. Blackburn R, Coid JW. Empirical clusters of DSM-III personality disorders in violent offenders. J Pers Disord. 1999;13:18-34.

47. Jordan BK, Schlenger WE, Fairbank JA, Caddell JM. Prevalence of psychiatric disorders among incarcerated women: II. Convicted felons entering prison. Arch Gen Psychiatry. 1996;53:513-519.

48. Mir J, Kastner S, Priebe S, Konrad N, Ströhle A, Mundt AP. Treating substance abuse is not enough: Comorbidities in consecutively admitted female prisoners. Addict Behav. 2015;46:25-30.

49. Davison S, Leese M, Taylor PJ. Examination of the screening properties of the Personality Diagnostic Questionnaire 4+ (PDQ-4+) in a prison population. J Pers Disord. 2001;15:180-194.

50. Zimmerman M, Chelminski I, Young D. The frequency of personality disorders in psychiatric patients. Psychiatr Clin North Am. 2008;31:405-420.

51. Kantojärvi L, Veijola J, Läksy K, et al. Comparison of hospital-treated personality disorders and personality disorders in a general population sample. Nord J Psychiatry. 2004;58:357-362.

52. Zimmerman M. A review of 20 years of research on overdiagnosis and underdiagnosis in the Rhode Island Methods to Improve Diagnostic Assessment and Services (MIDAS) project. Can J Psychiatry. 2016;61:71-79.

53. Zimmerman M, Chelminski I, Dalrymple K, Rosenstein L. Principal diagnoses in psychiatric outpatients with borderline personality disorder: Implications for screening recommendations. Ann Clin Psychiatry. 2017;29:54-60.

54. Aragonès E, Salvador-Carulla L, López-Muntaner J, Ferrer M, Lluís Piñol J. Registered prevalence of borderline personality disorder in primary care databases. Gac Sanit. 2013;27:171-174.

55. Gross R, Olfson M, Gameroff M, et al. Borderline personality disorder in primary care. Arch Intern Med. 2002;162:53-60.

56. Sansone RA, Sansone LA. Borderline personality disorder in the medical setting. Prim Care Companion CNS Disord. 2015;17(3):doi:10.4088/PCC.14r01743

57. Sansone RA, Sansone LA. Borderline personality disorder in the medical setting: Suggestive behaviors, syndromes, and diagnoses. Innov Clin Neurosci. 2015;12:39-44.

58. Dixon-Gordon KL, Conkey LC, Whalen DJ. (in press). Recent advances in understanding physical health problems in personality disorders. Curr Opin Psychol. 2018;21:1-5.

59. Dixon-Gordon KL, Whalen DJ, Layden BK, Chapman AL. A systematic review of personality disorders and health outcomes. Can Psychol. 2015;56:168-190.

60. Morioka D, Ohkubo F. Borderline personality disorder and aesthetic plastic surgery. Aesthetic Plast Surg. 2014;38:1169-1176.

61. Kalarchian MA, Marcus MD, Levine MD, et al. Psychiatric disorders among bariatric surgery candidates: Relationship to obesity and functional health status. Am J Psychiatry. 2007;164:328-334.

62. El-Gabalawy R, Katz LY, Sareen J. Comorbidity and associated severity of borderline personality disorder and physical health conditions in a nationally representative sample. Psychosom Med. 2010;72:641-647.

63. Lee HB, Bienvenu J, Cho S-J, et al. Personality disorders and traits as predictors of incident cardiovascular disease: Findings from the 23-year follow-up of the Baltimore ECA study. Psychosomatics. 2010;51:289-296.

64. McWilliams LA, Higgins KS. Associations between pain conditions and borderline personality disorder symptoms: Findings from the National Comorbidity Survey Replication. Clin J Pain. 2013;29:527-532.

65. Moran P, Stewart R, Brugha T, et al. Personality disorder and cardiovascular disease: Results from a national household survey. J Clin Psychiatry. 2007;68:69-74.

66. Casadio P, Olivoni D, Ferrari B, et al. Personality disorders in addiction outpatients: Prevalence and effects on psychosocial functioning. Subst Abuse. 2014;8:17-24.

67. Driessen M, Veltrup C, Wetterling T, John U, Dilling H. Axis I and axis II comorbidity in alcohol dependence and the two types of alcoholism. Alcohol Clin Exp Res. 1998;22:77-86.

68. DeJong CAJ, van den Brink W, Harteveld FM, van der Wielen EGM. Personality disorders in alcoholics and drug addicts. Compr Psychiatry. 1993;34:87-94.

69. Chavira DA, Grilo CM, Shea MT, et al. Ethnicity and four personality disorders. Compr Psychiatry. 2003;44:483-491.

70. McGilloway A, Hall RE, Lee T, Bhui KS. A systematic review of personality disorder, race, and ethnicity: Prevalence, aetiology and treatment. BMC Psychiatry. 2010;10(33): doi:10.1186/1471-244X-10-33.

71. Borges G, Orozco R, Rafful C, Miller E, Breslau J. Suicidality, ethnicity and immigration in the USA. Psychol Med. 2012;42:1175-1184.

72. U.S. Department of Health and Human Services. Mental health: Culture, race, and ethnicity—A supplement to Mental health: A report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services. 2001. http://www.surgeongeneral.gov/library/mentalhealth/cre/. Accessed April 29, 2011.

73. Gratz KL. Risk factors for deliberate self-harm among female college students: The role and interaction of childhood maltreatment, emotional inexpressivity and affect intensity/reactivity. Am J Orthopsychiatry. 2006;76:238-250.

74. Gratz KL, Latzman RD, Young J, et al. Deliberate self-harm among underserved adolescents: The moderating roles of gender, race, and school-level and association with borderline personality features. Personal Disord. 2012;3:39-54.

75. De Genna NM, Feske U. Phenomenology of borderline personality disorder: The role of race and socioeconomic status. J Nerv Ment Dis. 2013;201:1027-1034.

76. Newhill CE, Eack SM, Conner KO. Racial differences between African and White Americans in the presentation of borderline personality disorder. Race Soc Probl. 2009;1:87-96.

77. Reich J, Yates W, Nduaguba M. Prevalence of DSM-III personality disorders in the community. Soc Psychiatry Psychiatr Epidemiol. 1989;24:12-16.

78. Stangl D, Pfohl B, Zimmerman M. A structured interview for the DSM-III personality disorders: A preliminary report. Arch Gen Psychiatry. 1985;42:591-596.

79. Kass F, Skodol AE, Charles E, Spitzer RL, Williams JBW. Scaled ratings of DSM-III personality disorders. Am J Psychiatry. 1985;142:627-630.

80. Koenigsberg HW, Kaplan RD, Gilmore MM, Cooper AM. The relationship between syndrome and personality disorder in DSM-III: Experience with 2,462 patients. Am J Psychiatry. 1985;142:207-212.

81. Dahl AA. (1986). Some aspects of the DSM-III personality disorders illustrated by a consecutive sample of hospitalized patients. Acta Psychiatr Scand. 1986;73:61-67.

82. Fabrega H, Ulrich R, Pilkonis P, Mezzich J. Personality disorders diagnosed at intake in a public psychiatric facility. Hosp Community Psychiatry. 1993;44:159-162.

83. Herpertz S, Steinmeyer EM, Saß H. "Patterns of comorbidity" among DSM-III-R and ICD-10 personality disorders as observed with a new inventory for the assessment of personality disorders. Eur Arch Psychiatry Clin Neurosci. 1994;244:161-169.

84. Oldham JM, Skodol AE, Kellman HD, et al. Comorbidity of axis I and axis II disorders. Am J Psychiatry. 1995;152:571-578.

85. Ottosson H, Bodlund O, Ekselius L, et al. DSM-IV and ICD-10 personality disorders: A comparison of a self-report questionnaire (DIP-Q) with a structured interview. Eur Psychiatry. 1998;13:246-253.

86. Marinangeli MG, Butti G, Scinto A, et al. Patterns of comorbidity among DSM-III-R personality disorders. Psychopathology. 2000;33:69-74.

87. Fossati A, Maffei C, Bagnato M, et al. Patterns of covariation of DSM-IV personality disorders in a mixed psychiatric sample. Compr Psychiatry. 2000;41:206-215.

88. Korzekwa MI, Dell PF, Links PS, Thabane L, Webb SP. Estimating the prevalence of borderline personality disorder in psychiatric outpatients using a two-phase procedure. Compr Psychiatry. 2008;49:380-386.

89. Kaess M, von Ceumern-Lindenstjerna IA, Parzer P, et al. Axis I and II comorbidity and psychosocial functioning in female adolescents with borderline personality disorder. Psychopathology. 2013;46:55-62.

90. Ha C, Balderas JC, Zanarini M, Oldham J, Sharp C. Psychiatric comorbidity in hospitalized adolescents with borderline personality disorder. J Clin Psychiatry. 2014;75:e457-e464. doi:10.4088/JCP.13m08696

Table 1.—Epidemiological Studies of BPD Prevalence in Community Samples

Study	*N*	Location	Criterion Set Used	BPD Measure	Prevalence (%)
Reich et al.[77] (1989)	401	Iowa, USA	DSM-III	PDQ	1.3
Swartz et al.[10] (1990)	1541	North Carolina, USA	DSM-III	DIS	1.8
Torgersen et al.[23] (2001)	2053	Oslo, Norway	DSM-III-R	SIDP	0.7
Samuels et al.[12] (2002)	742	Maryland, USA	DSM-IV	IPDE	0.5
Crawford et al.[15] (2005)	716	New York, USA	DSM-IV	CIC-SR	2.2
Coid et al.[24] (2006)	626	Great Britain	DSM-IV	SCID-II	0.7
Lenzenweger et al.[20] (2007)	5692	continental USA	DSM-IV	IPDE	1.4
Trull et al.[22] (2010)	34653	USA	DSM-IV	AUDADIS-IV	2.7
Zanarini et al.[25] (2011)	6330	Bristol, England	DSM-IV	UK-CI-BPD	3.2
ten Have et al.[26] (2016)	5303	Netherlands	DSM-IV	IPDE	1.1

PDQ = Personality Diagnostic Questionnaire; DIS = Diagnostic Interview Schedule; SCID-II = Structured Clinical Interview for DSM Personality Disorders; SIDP = Structured Interview for DSM Personality Disorders; IPDE = International Personality Disorders Examination; CIC-SR = Children in the Community Self Report Scales; UK-CI-BPD = UK Childhood Interview for DSM-IV Personality Disorder; AUDADIS-IV = Alcohol Use Disorder and Associated Disabilities Interview Schedule for DSM-IV

Table 2.—Epidemiological Studies of BPD Prevalence in Psychiatric Samples

Study	*N*	Setting	Criterion Set Used	BPD Measure	Prevalence (%)
Stangl et al.[78] (1985)	131	Inpatient and outpatient	*DSM-III*	SIDP	22.1
Kass et al.[79] (1985)	609	Outpatient	*DSM-III*	clinical	11.0
Koenigsberg et al.[80] (1985)	2462	Mixed	*DSM-III*	clinical	12.3
Dahl[81] (1986)	231	Inpatient	*DSM-III*	SIB	20.3
Fabrega et al.[82] (1993)	18179	Evaluation	*DSM-III*	clinical	2.1
Herpertz, Steinmeyer, & Saß[83] (1994)	231	Inpatient	*DSM-III-R*	AMPS	13.6
Molinari et al.[39] (1994)	200	Inpatient	*DSM-III-R*	SIDP-R	6.5
Oldham et al.[84] (1995)	100	Outpatient evaluation	*DSM-III-R*	PDE	18.0
Oldham et al.[84] (1995)	100	Inpatient evaluation	*DSM-III-R*	PDE	64.0
Grilo et al.[33] (1998)	138	Inpatient	*DSM-III-R*	PDE	49.3
Grilo et al.[33] (1998)	117	Inpatient	*DSM-III-R*	PDE	42.7
Ottosson et al.[85] (1998)	138	Mixed	*DSM-IV*	DIP-I	33.3
Marinangeli et al.[86] (2000)	156	Inpatient	*DSM-III-R*	SCID-II	40.4
Fossati et al.[87] (2000)	431	Inpatient and outpatient	*DSM-IV*	SCID-II	22.5
Chanen et al.[35] (2004)	101	Outpatient	*DSM-IV*	SCID-II	10.9
Kantojärvi et al.[51] (2004)	444	Inpatient	*DSM-III-R*	clinical	5.6
Korzekwa et al.[88] (2008)	360	Outpatient	*DSM-IV*	DIB-R	22.6
Kaess et al.[89] (2013)	87	Inpatient and outpatient	*DSM-IV*	SCID-II	35.6
Ha et al.[90] (2014)	418	Inpatient	*DSM-IV*	CI-BPD	32.8
Comtois & Carmel[7] (2016)	159	Outpatient	*DSM-IV*	PDE	15.1
Zimmerman et al.[53] (2017)	3674	Outpatient	*DSM-IV*	SIDP	10.6

SCID-II = Structured Clinical Interview for DSM Personality Disorders; SIDP = Structured Interview for DSM Personality Disorders; PDE = Personality Disorders Examination; SIB = Schedule for Interviewing Borderlines; AMPS = Aachen List of Items for the Registration of Personality Disorders; DIP-I = DSM-IV and ICD-10 Personality Interview; DIB-R = Revised Diagnostic Interview for Borderlines; CI-BPD = Childhood Interview for *DSM-IV* Borderline Personality Disorder.