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BRIEF REPORT

Residential eating disorder outcomes associated with screening positive for substance use disorder and borderline personality disorder

Thomas J. Weigel MD[1,2] | Shirley B. Wang BA[3] | Jennifer J. Thomas PhD[2,4] | Kamryn T. Eddy PhD[2,4] | Casey Pierce BA[2] | Mary C. Zanarini EdD[1,5] | Garrett Fitzmaurice ScD[5,7] | Alisa Busch MD, MS[2,6,8,9]

[1]Department of Psychiatry, McLean Hospital, Belmont, Massachusetts

[2]Department of Psychiatry, Harvard Medical School, Boston, Massachusetts

[3]Department of Psychology, Harvard University, Cambridge, Massachusetts

[4]Eating Disorders Clinical and Research Program, Massachusetts General Hospital, Boston, Massachusetts

[5]Laboratory for the Study of Adult Development, McLean Hospital, Belmont, Massachusetts

[6]Health Services Research Division, Partners Psychiatry and Mental Health, Boston, Massachusetts

[7]Department of Biostatistics, Harvard School of Public Health, Boston, Massachusetts

[8]Department of Health Care Policy, Harvard Medical School, Boston, Massachusetts

[9]Clinical Services Administration, McLean Hospital, Belmont, Massachusetts

Correspondence
Alisa Busch, M.D., M.S. McLean Hospital 115 Mill Street, Mailstop 226 Belmont, MA 02478.
Email: abusch@mclean.harvard.edu

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Abstract

Objective: We examined whether eating disorder (ED) outcome trajectories during residential treatment differed for patients screening positive for comorbid borderline personality disorder (BPD) and/or substance use disorders (SUDs) than those who do not.

Method: We examined data from patients in a residential ED treatment program. Patients completed validated self-report surveys to screen for SUDs and BPD on admission, and the ED Examination-Questionnaire (EDE-Q) on admission and every 2 weeks until discharge (N = 479 females).

Results: Fifty-four percent screened positive for at least one co-occurring condition. At admission, patients screening positive for SUD and/or BPD had significantly greater eating pathology than patients screening negative for both (t[477] = 8.23, p < .001). Patients screening positive for SUD (independent of BPD screening status) had a significantly faster rate of symptom improvement during the initial 4 weeks than patients screening positive for BPD only and those with no comorbidities.

Discussion: Screening positive for SUD and/or BPD was common in residential ED treatment, and associated with more severe ED symptoms. Screening positive for SUD was associated with faster ED symptom improvement than screening positive for BPD. These findings suggest that intensive ED treatment, even in the absence of intensive SUD treatment, may enhance patient outcomes for those with SUDs.

KEYWORDS

addiction, borderline personality disorder, eating disorder, residential treatment, substance use disorder

1 | INTRODUCTION

Eating disorders (EDs) are highly comorbid with borderline personality disorder (BPD) (Rowe et al., 2008) and substance use disorders (SUD) (Ackard et al., 2014). These comorbidities are associated with worse clinical presentation and outcomes. Comorbid BPD among individuals with EDs is associated with greater emotion dysregulation (Ben-Porath, Wisniewski, & Warren, 2009), feelings of ineffectiveness, disturbances in interceptive awareness, and general psychopathology (Zeeck et al., 2007). Similarly, SUDs are associated with heightened behavioral dysregulation (Thompson-Brenner et al., 2008) and functional impairment (Glasner-Edwards et al., 2011) among individuals with anorexia nervosa (AN) and bulimia nervosa (BN). Based on these differences, alongside evidence of high rates of diagnostic crossover in EDs (Eddy et al., 2008) and heterogeneity of clinical presentation within ED diagnostic categories (Mitchell et al., 2007), there has been an increased interest in subtyping individuals with EDs based on comorbid psychopathology (Wildes & Marcus, 2013).

In a seminal article on "multi-impulsive bulimia," Lacey and Read (1993) described a subset of individuals with EDs characterized by multiple impulsive behaviors including self-harm, suicidality, and SUDs. Since then, several studies have examined the impact of classifying individuals with EDs based on various impulsive-spectrum features, including BPD and SUD symptoms. These studies suggest BPD traits are associated with less improvement in ED symptoms (Johnson, Tobin, & Dennis, 1990) and greater psychiatric disturbance (Steiger & Stotland, 1996) after outpatient treatment. Although we are not aware of any studies examining treatment change based on presence or absence of SUDs, substance use problems predict worse longitudinal outcome among individuals with EDs (Keel et al., 1999).

Most existing research examining clinical outcomes based on comorbid psychopathology subgroups has utilized outpatient samples. Although several studies have reported clinical outcomes data from residential treatment (Anderson et al., 2017; Dlinsky et al., 2010; Friedman et al., 2016), little is known about how outcomes may differ by comorbidity-based classification for ED patients in residential treatment (i.e., non-hospital live-in treatment center for patients who are medically stable but very psychologically unwell). Patients in the US who are typically referred to residential programs are those who have more severe EDs and psychiatric comorbidity than patients in lower levels of care (e.g., outpatient), but are medically stable and do not require 24/7 medical care as in a specialist ED inpatient unit (APA, 2006). Thus, associations between common comorbidities and ED outcomes in a severely ill population receiving intensive services could differ from those in ambulatory care. We examined whether ED symptoms differed for patients in residential treatment based on screening positive for BPD and/or SUD. We hypothesized that patients who screened positive for BPD or SUD would have greater symptom severity on admission and demonstrate a slower and less complete response to treatment. We further predicted that patients who screened positive for both comorbid conditions would have more severe symptoms throughout treatment than those who screened positive for one comorbid disorder alone.

2 | METHOD

2.1 | Study setting and population

Participants were patients in a residential ED program between November 15th, 2010 and September 16th, 2014. Treatment included individual therapy (3×/week), family therapy (1–2×/week), daily group therapy, nutritional counseling, nursing care, meal planning, and psychopharmacologic treatment as needed. Patients did not have access to substances, and those with SUDs attended a weekly group on SUD recovery and if clinically indicated, additional group therapy sessions in a SUD treatment program on campus. The program included step-down to a partial hospital care (with the same treatment team and programming from 7 a.m. to 7 p.m. as residential patients), which typically occurs after 30 days of residential treatment. ED diagnoses were established by program staff (psychiatrists, psychologists, social workers, and clinical fellows) with expertise in EDs. Inter-rater reliability between clinical diagnoses and those conferred via Structured Clinical Interview for DSM-IV at this site are excellent (k = 0.70, Thomas et al., 2015).

Among 557 discharges during this observation period, we excluded 78 patients (14%), for a sample of N = 479. Patients were excluded due to lack of valid surveys following the initial survey (n = 63), staff/administration error leading to no data stored (n = 8), and incomplete responses leading to indeterminate SUD status or ED data (n = 7). Excluded patients were less likely to be white (p < .001), slightly older (p = .04), and had higher educational attainment (p = .03). Over 75% of participants completed >4 weeks of treatment; half (50.5%) completed >6 weeks (we examined treatment duration by screening results and found similar mean lengths of stay by patient group). As part of routine clinical care, patients completed computer-based self-report measures on admission, every 2 weeks, and at discharge. This study was approved by hospital Institutional Review Board.

2.2 | Measures

Alcohol Use Disorders Identification Test (AUDIT-C; Bradley et al., 2003) screened for alcohol use disorders. The AUDIT-C has a sensitivity/specificity of 0.84/0.85 for identifying problematic alcohol use (Bradley et al., 2003). Consistent with established cut-off scores (Bradley et al., 2003), scores >3 were considered a positive screen.

Drug Abuse Screening Test (DAST-10; Cocco & Carey, 1998) screened for drug use disorders (Cocco & Carey, 1998). We initially used the DAST-10, with a sensitivity/specificity of 0.7/0.8 (Bradley et al., 2003). Beginning February 2014, we transitioned to using the first item as an ultra-brief screen, after confirming comparable sensitivity/specificity with the single measure (Hearon et al., 2015). Scores >0 on the single item are considered positive.

McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003) screened for BPD. Scores ≥7 are considered a positive screen, with sensitivity/specificity of 0.90/0.93 for psychiatric patients (Zanarini et al., 2003).

Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 2008) assessed ED symptoms. The EDE-Q has well-established reliability and validity (Berg et al., 2012), and is highly correlated the EDE

interview, which is routinely used to evaluate clinical outcomes in randomized controlled trials.

2.3 | Data analysis

We examined data for missing EDE-Q responses. Among 7,336 EDE-Q items, 99.3% (N = 7,285) were complete. As a majority of items were non-missing, the global EDE-Q score was calculated as the average of domain scores (the average of non-missing individual survey items; Fairburn, Wilson, & Schleimer, 1993).

To examine whether longitudinal trajectory of ED symptoms differed by comorbidity screening status, we constructed four mutually exclusive categories based on SUD/BPD screeners: (a) SUD only; (b) BPD only; (c) SUD + BPD; and (d) none. Control variables included age and ethnicity (dichotomous as white = yes/no, given low frequency of other racial/ethnic categories). Time was measured in days, as there was some variation from the program policy of survey administrations every 2 weeks (71.5% within 2 days of expected administration and 91.4% within 7 days).

To examine whether SUD/BPD screening status was associated with EDE-Q longitudinal trajectories, we first examined EDE-Q trajectories, unadjusted, for the four categories of patients. We fit local regression (LOESS) flexible smooth curves (Cleveland, 1979) separately for each of the four co-occurring disorder screening groups. After noting a distinct change in slopes around day 30 (corresponding to when patients typically transition to partial hospital), we modeled EDE-Q trajectories as piecewise-linear curves with the first piece covering days 1–30 and the second piece covering day 31-week 9. We fit a piecewise-linear mixed effects regression model (Cleveland, 1979) and examined the effects of SUD/BPD screening status on patterns of change in EDE-Q in both time segments (days 1–30, day 31-week 9). This model accounted for correlation among repeated EDE-Q measures and adjusted for age and race.

3 | RESULTS

Over a third (41.3%) of participants screened positive for SUD, one-third (33.2%) for BPD, one-fifth (19.4%) for both, and less than half (44.9%) for none. In unadjusted results, screening positive for SUD and/or BPD was associated with significantly greater eating pathology than participants who screened negative for both (t[477] = 8.23, p < .001). Table 1 presents baseline EDE-Q scores for all participants groups (BPD, SUD, BPD + SUD, and none).

There was no significant difference in the pattern of symptom change over time based on screening positive for BPD (X^2[2] = 3.85, p > .14) (Figure 1). However, trajectories were significantly different for those who screened positive for SUD (X^2[2] = 10.05, p < .01), regardless of BPD status. Specifically, those who screened positive for SUD had a significantly steeper reduction (faster rate of improvement) in EDE-Q scores during the initial 30 days of treatment (Z = −3.17, p < .002) than patients screening positive for BPD or no comorbidities.

The LOESS smooth curve (Figure 1; unadjusted) and the piecewise linear trends (Supplementary Figure 1; adjusted piecewise linear model) demonstrated these different trajectories of improvement, which remained, even after the first 30 days of treatment when there were no significant additional changes in the mean EDE-Q through the remaining 9-weeks of treatment. There was no evidence of an interaction between SUD and BPD screening status on symptom change over time (X^2[2] = 3.48, p > .17).

TABLE 1 Characteristics of study population in eating disorder residential/partial hospital treatment program (N = 479) between November 15th, 2010, and September 16th, 2014

Characteristics	N	%/M(SD)
Female	479	100.00%
Race		
American Indian or Alaskan	6	1.30%
Asian	15	3.10%
Black or African American	9	1.90%
White	436	91.00%
Native Hawaiian or Pacific islander	0	0.00%
Caribbean islander	6	1.30%
Latino/a	15	3.10%
Choose not to answer or do not know	16	3.30%
Education[a]		
8th grade or less	21	4.40%
Some high school	172	36.00%
High school grad/GED	53	11.10%
Some college	198	41.40%
4-year college grad	20	4.20%
Post-college education	14	2.90%
Hospitalized in past 6 months	195	40.80%
Employed in the past 30 days[a]	162	33.90%
Are you a student? (yes)[b]	403	84.50%
Length of stay in program (up to 8 weeks of study observation)		
0–<2	19	4.00%
2–<4	92	19.20%
4–<6	126	26.20%
6–8	242	50.50%
Age		18.8 [3.04]
Overall baseline EDEQ score		4.06 [1.51]
SUD−/BPD−	215	3.47 [1.61]
SUD−/BPD+	66	4.65 [1.28]
SUD+/BPD−	105	4.36 [1.29]
SUD+/BPD+	93	4.66 [1.10]

[a] N Missing = 1.
[b] N Missing = 2.
EDEQ scores are presented for the total sample and subgroups based on comorbidity screening results for BPD and SUD. The rightmost column presents percentages for categorical variables (gender, race, education, hospitalization, employment, student status, length of stay in program), and means and standard deviations for quantitative variables (age, EDEQ scores).

4 | DISCUSSION

This study found that in a usual care residential ED treatment setting, co-occurring SUD and BPD symptoms were common. These rates were similar to previously reported SUD rates in AN (27.0%) and BN (36.8%) (Hudson, Hiripi, Pope, & Kessler, 2007), and slightly higher

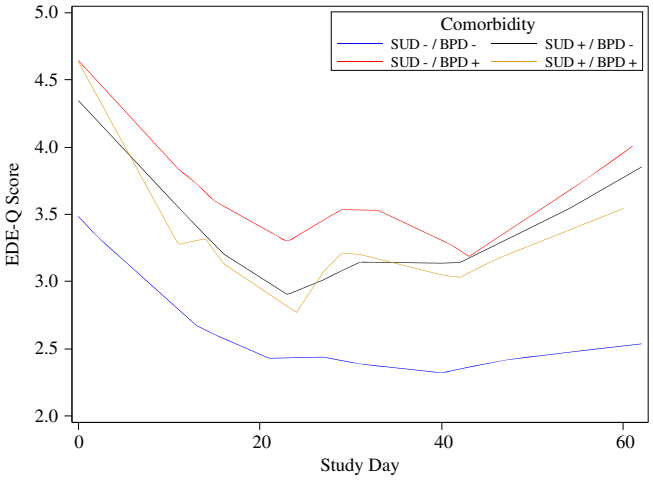

FIGURE 1 LOESS smooth of EDE-Q score by co-occurring disorder screening status [Color figure can be viewed at wileyonlinelibrary.com]

than previously reported BPD rates in AN (10%–25%) and BN (28%) (Sansone, Levitt, & Sansone, 2004). As hypothesized, patients screening positive for SUD, BPD, or both reported more severe ED symptoms on admission than patients screening negative for both. This is consistent with prior literature demonstrating greater severity and functional impairment among individuals with EDs and comorbid BPD or SUD (Rowe et al., 2008; Thompson-Brenner et al., 2008).

In this study, ED symptoms improved during the course of treatment regardless of co-occurring disorders. However, ED symptom trajectories during the first 30 days of treatment varied by screening status. Those screening positive for SUD (independent of BPD) had greater improvement in ED symptoms. This is in contrast to an outpatient study which found that ED treatment response was not influenced by baseline alcohol intake levels (Karačić et al., 2011). One plausible reason for these differences is that the first 30 days typically involves our residential setting in which patients are prevented from using substances. Abstinence from substances may diminish their adverse mood and food intake effects, both of which contribute to ED symptoms. Notably, however, despite more rapid gains in improvement, patients screening positive for SUD still had higher ED severity at discharge than those screening negative.

In contrast, screening positive for BPD was associated with a worse baseline ED severity, but a similar rate of improvement in symptoms, than screening negative for BPD. Interestingly, patients who screened positive for SUD and BPD had faster symptom improvement than those with BPD alone. This is perhaps because while access to substances is removed in residential treatment, BPD symptoms represent chronic cognitive and behavioral patterns, such that participants are likely to remain symptomatic of BPD during residential care.

Our data should be interpreted in light of limitations. First, they are derived from a single, free-standing ED program with a predominantly white, student-based population, which may limit generalizability to other ED programs or populations. Additionally, we did not have information about ED diagnoses, and were unable to determine if diagnoses moderated trajectories of change among participants. Moreover, although BPD has historically been considered an adult diagnosis, our sample included adolescents screening positive for BPD. However, recent studies found that prevalence, reliability, validity, and symptom profile of BPD in adolescents is similar to adults, suggesting BPD can be meaningfully assessed in adolescents (Zanarini, Frankenburg, Hennen, Reich, & Silk, 2006, 2017). Finally, we cannot make causal inferences about screening positive for SUD/BPD and ED outcomes. It is possible that other, unobserved patient characteristics are also associated with these outcomes.

This study contributes important new information about ED outcome trajectories for patients screening positive for SUD and/or BPD in a large sample (>400 patients). Strengths include prospective measurement, and data from an intensive residential setting with high survey response and retention rates. Indeed, a recent meta-analysis of 34 treatment studies highlighted the prognostic value of rapid response, with early symptom change predicting improvement at end-of-treatment and longitudinal follow-up (Linardon et al., 2016). Thus, our findings could be important for understanding the impact of SUD/BPD on ED treatment. These findings suggest that intensive ED treatment, even in the absence of intensive SUD treatment, and may enhance patient outcomes for those with SUDs.

ORCID

Thomas J. Weigel https://orcid.org/0000-0002-0286-8458
Shirley B. Wang https://orcid.org/0000-0002-8583-3014
Jennifer J. Thomas https://orcid.org/0000-0003-2601-581X

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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