Momentary emotion surrounding bulimic behaviors in women with bulimia nervosa and borderline personality disorder

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\textbf{A B S T R A C T}

\textit{Background:} Bulimia nervosa (BN) and borderline personality disorder (BPD) are disorders that involve emotion dysregulation, for negative emotion in particular, as well as impulsive behaviors beyond binge eating and vomiting. Given these similarities in psychopathology, it is not surprising that those with BN also present with BPD in approximately one third of cases. Improved understanding of similarities and differences in the experience of negative and positive emotion could aid in the development of treatments specifically tailored to the needs of these disorders.

\textit{Methods:} In this study, we examined Ecological Momentary Assessment (EMA) data from 133 women diagnosed with BN, 25 of whom also exhibited diagnostic levels of BPD. Emotions and behaviors were assessed daily, with multiple random and event-contingent signals to complete questionnaires on portable digital devices, for a period of two weeks.

\textit{Results:} Results indicated that the BPD group experienced higher negative emotional variability on bulimic event days. Both groups also demonstrated increasing negative emotion and decreasing positive emotion pre- binge eating and vomiting, with levels of negative emotion decreasing and positive emotion increasing after, for both behaviors.

\textit{Conclusions:} In terms of group differences, additive effects were found for the BN comorbid with BPD group, who demonstrated greater negative emotional variability, on bulimic event days. Both groups also demonstrated increasing negative emotion and decreasing positive emotion pre- binge eating and vomiting, with levels of negative emotion decreasing and positive emotion increasing after, for both behaviors.

Bulimia nervosa (BN) is a disorder involving frequent binge eating episodes, compensatory behaviors such as vomiting and laxative use to avoid weight gain, as well as self-concept dominated by shape and weight (APA, 1994). The health consequences of this disorder can be severe and include cardiovascular problems, electrolyte disturbances, and gastrointestinal disorders (Bulik et al., 2002). Furthermore, people with BN have high rates of personality disorders (Godt, 2008). Of those co-occurring personality disorder diagnoses, borderline personality disorder (BPD) is the most common, with comorbidity rates of around 30\% (Cassin and von Ranson, 2005; Wonderlich and Mitchell, 1992). BPD is a chronic and severe disorder characterized by chaotic interpersonal relationships, emotional reactivity, anger control problems, identity diffusion, various forms of dysregulated behaviors, chronic feelings of emptiness, and self-injurious and suicidal behavior (APA, 1994). Given the severe and dysregulated nature of both disorders, more research is needed to understand how BN co-occurring with BPD may be different than BN alone.

1. Emotion dysregulation in bulimia nervosa and borderline personality disorder

Over the last decade research has identified that emotion dysregulation plays a major role in the propagation and maintenance of both BN and BPD symptomatology. Emotion dysregulation refers to the inability to control and modulate one’s affective state to such a degree that emotions are experienced as out of control (Shedler...
and Westen, 2004). Interestingly, many people with BN exhibit emotional dysregulation and impulsive behaviors (beyond binge eating and vomiting), even without a simultaneous BPD diagnosis (Crosby et al., 2009; Myers et al., 2006). Emotional variability is one form of emotion dysregulation, where an individual will experience his or her emotions as fluctuating frequently, rather than being centered around a consistent average within-person level, and may be applied to both positive and negative emotion. For example, someone with high variability in emotion may experience elevated negative emotion in the morning, be euthymic in the afternoon, and then be upset again at night. Importantly, some studies have found a strong link between BPD and emotional variability (Koenigsberg et al., 2002; Henry et al., 2001).

Often understudied, in both BN and BPD, is the dysregulation or variability of positive emotion; different responses in positive emotion may be an important factor in distinguishing these disorders. For example, studies of BN have found increases in positive emotion following binge eating and vomiting (Smyth et al., 2007) and self-injury (Muehlenkamp et al., 2009). On the other hand, some studies have failed to find evidence of positive emotional variability in BPD (Klonsky, 2008; Selby et al., 2009). One potential reason for these different findings may be related to vomiting, which in those with BN may result in momentary elevations in positive emotion due to a sense of having “undone” the negative effects of binge episodes, a feeling of control, or maintaining progress toward a weight goal. This same experience of positive emotion post-binge eating and vomiting may not be as functionally reinforcing in individuals without high-level body weight and shape concerns.

Regardless of what may be causing emotional variability in these disorders, and differences in variability of positive and negative emotion, establishing qualitative and quantitative differences between those with BN and BPD, relative to those with BN alone, may provide a richer understanding of the different roots of behavioral dysfunction. One important implication of this comorbidity is the potential for an additive effect between the two disorders, where there are more frequent and intense experiences of negative or positive emotion due to the combination of problems regulating emotions and behavior, frequent concerns with interpersonal relationships, and weight/shape related stressors seen in individuals with both diagnoses. Furthermore, when both disorders are present, the underlying biological and cognitive vulnerabilities toward dysregulated emotion may work in an additive effect.

2. Emotional impact of dysregulated eating behaviors

Emotion regulation models of dysregulated eating behaviors suggest that binge eating and vomiting occur following increasing levels of negative emotion, and that the behavior results in a decrease in negative emotion (Selby et al., 2008). These functions are supported by numerous cross-sectional studies on binge eating and vomiting (Agras and Telch, 1998; Lynch et al., 2000) as well as longitudinal ecological momentary assessment studies (Anestis et al., 2010; Smyth et al., 2007). Binge eating and vomiting behaviors help decrease experience of negative emotion by narrowing attention away from upsetting thoughts and focusing on the concrete physical stimuli associated with the binge eating (Selby et al., 2008).

Consistent with this conceptualization, Smyth et al. (2007) found that negative emotion increased and positive emotion decreased in the hours prior to a binge or purge in individuals with bulimia nervosa. Conversely, they also found that following the binge, levels of negative emotion decreased and positive emotion increased in these individuals. Thus, these findings point out that the potential for emotion regulating effect of binge eating and vomiting are still at issue, and that the emotion regulation functions of dysregulated eating behaviors may be acute and frequently followed by additional emotion dysregulation. Nonetheless, more empirical exploration of emotional states surrounding dysregulated eating behaviors is needed.

3. Binge eating versus vomiting

In general, trajectories of emotion prior to and after binge eating and vomiting have been studied with relatively the same expectations, increasing negative emotion before and decreased negative emotion afterward (Smyth et al., 2007). Yet, few studies have actually looked at potential differences in the quality of emotion surrounding these behaviors separately. Binge eating and vomiting are highly related behaviors, yet they are also fundamentally distinct and as such they may arise in response to different emotional experiences or exhibit differential effects on emotion post-behavior. So the emotional context of both binge eating and vomiting individual warrants further investigation.

4. Current study

Various aspects of mood and behavior have been examined in eating disordered and personality disorder samples using ecological momentary assessment (EMA; Stone and Shiffman, 1994). EMA is a relatively new and innovative way to collect data that partially circumvents the limitations inherent to self-report measures, as it reduces retrospective recall bias while also allowing for assessment in a natural setting. A number of studies implementing EMA in the areas of eating disorders and BPD have been published in the past decade (Greeno et al., 2000; Le Grange et al., 2001; Russell et al., 2007; Trull et al., 2008; Wegner et al., 2002; Wonderlich et al., 2007). Although various aspects of emotion in samples of women with BN or BPD have been examined via EMA techniques, no studies to date have used EMA to investigate the emotion—behavior relationship for those with comorbid BN and BPD. The present study contrasts emotional responding surrounding binge eating and vomiting, in a sample of women with BN and no BPD diagnosis (BN) compared to women with BN and diagnostic levels of BPD (BN + BPD). We predicted that greater levels of temporal variability would be seen in the BN + BPD group than in the BN only group. This prediction was based on a broad array of reasons to experience emotion variability in the combined BPD + BN group (due to difficulty regulating emotions and impulsive behaviors, coupled with interpersonal concerns), but also because of potential underlying biological and cognitive dispositions to emotion variability in both disorders that may have an additive effect. Thus, for the present study, we hypothesized that those with BN + BPD, in comparison to those with BN alone, would have (1) greater daily variability in levels of negative emotion and positive emotion, (2) this effect would be even larger on days when bulimic events occurred, (3) increased trajectories of negative emotion and positive emotion preceding binge/vomit behaviors, and (4) increased trajectories of negative emotion and positive emotion following binge/vomit behaviors.

5. Methods

Participants were 133 adult females who were recruited from the community and who met criteria for BN (assessment procedure described below). Women were either referred for the study by their physicians, eating disorder treatment providers, or self-referred via community flyers. All completed a telephone screen to confirm eligibility prior to in-person assessment (i.e., inclusion criteria: female, age ≥ 18, meets DSM-IV criteria for BN, no changes
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