



Emotional reactivity in a clinical sample of patients with eating disorders and nonsuicidal self-injury



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ABSTRACT

Emotional reactivity is theorized to contribute to both eating disorders (ED) and nonsuicidal self-injury (NSSI). Although EDs and NSSI frequently co-occur, no study has examined emotional reactivity in individuals with both conditions. This study examined the following hypotheses in a large clinical sample ($N = 648$): (1) patients with co-occurring ED and NSSI would report higher emotional reactivity and more severe clinical characteristics; (2) among those with EDs, patients with bulimia nervosa (BN) would be more likely to report NSSI and evidence higher emotional reactivity compared to those with anorexia nervosa (AN); and (3) higher emotional reactivity would be associated with worse treatment outcomes. Data were collected at admission and discharge from inpatient, partial hospitalization, and intensive outpatient treatment programs for EDs or NSSI. The NSSI-only and co-occurring groups reported significantly higher emotional reactivity than the ED-only group. Among those with EDs, individuals with BN reported higher emotional reactivity and were more likely to engage in NSSI compared to those with AN. Emotional reactivity was inconsistently related to treatment outcomes among the co-occurring and ED-only groups. In sum, results highlight the importance of emotional reactivity in clinical presentations, particularly when NSSI is present.

1. Introduction

Eating disorders (EDs) and nonsuicidal self-injury (NSSI) are two maladaptive behaviors with substantial co-occurrence that represent significant mental and physical health concerns (Cucchi et al., 2016; Kostro et al., 2014). Among those with EDs, a recent meta-analysis reported a lifetime history of NSSI of 32.7% among those with bulimia nervosa (BN) and 27.3% among those with anorexia nervosa (AN) (Cucchi et al., 2016). Among those with NSSI, one study found 19.4% of participants with a history of NSSI also experience ED symptoms (Muehlenkamp et al., 2012), while another study found 29.9% of people being treated for NSSI engaged in bingeing, purging, or food restriction (Washburn et al., 2015).

The co-occurrence of these disorders has led to attempts to identify shared risk factors. Both EDs and NSSI are associated with a range of emotion regulation deficits (e.g., Klonsky, 2007; Lavender et al., 2015). Similarly, Muehlenkamp et al. (2012) found that emotion regulation deficits were associated with both ED and NSSI behaviors, and levels of emotion dysregulation and depression were highest among those who reported both behaviors. Thus far, however, it remains unclear if there

are predisposing factors underlying emotion regulation deficits and the co-occurrence of EDs and NSSI (Claes and Muehlenkamp, 2013).

Emotional reactivity has recently been theorized as a risk factor for the development and maintenance of co-occurring ED and NSSI (Claes and Muehlenkamp, 2013). Emotional reactivity refers to the strength and duration with which positive and negative emotions are experienced (Nock et al., 2008). Heightened emotional reactivity may contribute to the development and maintenance of behavioral problems, such as EDs and NSSI, that are associated with broader emotional regulation deficits (Claes, 2014; Chapman et al., 2013; Nock et al., 2008). That is, individuals who are predisposed to experience emotions as more aversive and intolerable may resort to more extreme, maladaptive coping responses to regulate emotions.

Emotional reactivity is distinct from related emotional regulation constructs such as impulsivity, inhibitory control, and negative urgency. Whereas emotional reactivity refers to a subjective experience of emotions, impulsivity refers a range of cognitive and behavioral responses to stimuli without forethought or regard for consequences (Evenden, 1999). Negative urgency specifically refers to the tendency to act impulsively *while* experiencing extreme negative emotions

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(Cyders and Smith, 2008). In contrast to impulsivity and negative urgency, inhibitory control reflects the capacity to override prepotent cognitive or behavioral responses that are inconsistent with goal-directed behavior (Diamond, 2013). Thus, individuals who are prone to elevated emotional reactivity may also exhibit elevations in impulsivity and negative urgency, and decreased inhibitory control, ultimately contributing to maladaptive coping responses to seek immediate relief from emotional distress. Previous research supports this conceptualization, finding emotional reactivity positively associated with behavioral inhibition but negatively associated with attentional and behavioral control (Carol et al., 2014; Claes et al., 2014; Klonsky et al., 2003; Nock et al., 2008).

1.1. Emotional reactivity in NSSI and EDs

Emotional reactivity has been implicated in both EDs and NSSI. Several studies have found that emotional reactivity is elevated among people who engage in NSSI (e.g., Franklin et al., 2012; Klonsky et al., 2003; Glenn et al., 2011). With respect to EDs, few studies have specifically examined emotional reactivity. For example, two studies examined emotional reactivity with ED samples using the Emotion Reactivity Scale (ERS; Nock et al., 2008). The initial validation study of the ERS found emotional reactivity elevated across psychiatric diagnoses; however, scores were highest among the small subsample ($n = 6$) of patients with EDs (Nock et al., 2008). Claes et al. (2014) also found higher ERS scores among high school students with ED symptoms compared to those without these symptoms. In contrast to Nock et al. (2008), students with symptoms of NSSI had *higher* rates of ERS total scores than those with ED symptoms. In addition, a recent study found emotional reactivity, as measured through an experimental procedure, to be higher in BN than AN (Tapajoz et al., 2015).

1.2. The present study

Despite recent interest in both emotional reactivity (Lannoy et al., 2014) and the co-occurrence of ED and NSSI (Claes and Muehlenkamp, 2013), little is known about emotional reactivity in co-occurring ED and NSSI. While a theoretical model has identified emotional reactivity as a risk factor for co-occurring ED and NSSI (Claes and Muehlenkamp, 2013), and prior studies demonstrated that individuals with co-occurring ED and NSSI experience maladaptive emotion regulation (Claes et al., 2014), it is unclear if emotional reactivity differs between individuals with only ED, those with only NSSI, and those with co-occurring ED and NSSI. Indeed, emotional reactivity may be additive in co-occurring ED and NSSI; alternatively, emotional reactivity may be similarly elevated across these groups, which could suggest it is a more general than specific risk factor. To date, however, no study has compared levels of emotional reactivity between these groups or assessed how emotional reactivity influences treatment. If heightened reactivity is related to a worse prognosis, this may indicate a need to more specifically target emotion regulation skills during treatment (Wonderlich et al., 2014).

The primary aim of the present study was to address these gaps by examining emotional reactivity and other relevant domains in a large clinical sample of patients categorized into ED-only, NSSI-only, and co-occurring ED and NSSI groups. First, we compared emotional reactivity between these groups, hypothesizing that patients with co-occurring NSSI and ED would evidence higher emotional reactivity than those with ED-only or NSSI-only. Second, we examined whether these groups differed in condition-specific psychopathology (i.e., overall ED psychopathology and NSSI frequency) and quality of life. While worse quality of life is associated with EDs and NSSI (e.g., Agh et al., 2016; Ammerman et al., 2017) and may convey a more severe clinical presentation, quality of life has not been investigated among those with both ED and NSSI. Based on an additive model of psychopathology, we expected that the co-occurring group would exhibit greatest severity

condition-specific psychopathology and impairment in quality of life. Third, we assessed whether emotional reactivity is associated with treatment outcomes (i.e., changes in ED or NSSI frequency) in these groups. We predicted higher emotional reactivity at admission would be associated with worse treatment outcomes, and that diagnostic grouping would moderate this association such that those with co-occurring ED and NSSI would evidence worse outcomes.

As a secondary aim, we examined differences in ERS scores and NSSI frequency among those with EDs. We hypothesized that among individuals with EDs, those with BN would be more likely to exhibit NSSI and report higher levels of emotional reactivity compared to those with AN (Tapajoz et al., 2015).

2. Methods

2.1. Procedures

Data for this study were obtained from databases developed for clinical and organizational improvement purposes at a large non-profit hospital providing inpatient, partial hospitalization, and intensive outpatient treatment specifically for ED and/or NSSI. Patients completed measures at admission and discharge as part of routine clinical outcome assessment. Age, sex, and ethnicity were obtained from electronic medical records. Clinical diagnoses were provided at admission and confirmed at discharge by attending psychiatrists who specialize in ED and NSSI. All data were de-identified prior to analysis, and all study protocols were reviewed and found exempt by the hospital's Institutional Review Board.

2.2. Participants

The initial sample consisted of 660 patients from inpatient, partial hospitalization, and intensive outpatient programs for ED and NSSI. Participants were grouped into three categories: ED-only, NSSI-only, or co-occurring ED and NSSI based on a combination of patients' admission program (i.e., ED or NSSI) and data from clinical assessments administered at the time of admission. Specifically, "ED-only" included patients admitted to the ED program with a primary ED who denied ever engaging in NSSI; "NSSI-only" included patients admitted to the NSSI program with primary NSSI without a diagnosis of ED (i.e., AN, BN, Eating Disorder NOS [EDNOS], Binge Eating Disorder [BED]); and "co-occurring ED and NSSI" included patients admitted to the ED program with primary ED who also endorsed engaging in NSSI at least once in their lifetime, as well as patients admitted to the NSSI program with primary NSSI and diagnosed with an ED. Three patients were missing admission data, and were grouped according to their discharge program and discharge assessments. If patients had multiple episodes of care, they were grouped based on the data from their first admission and the earliest admission data (i.e., first episode of care) and latest discharge data (i.e., last episode of care) were used in all subsequent analyses. One patient was missing admission data but was identified as having a subsequent episode of care; for this patient the second admission data were used to establish group membership and for subsequent analyses. Additionally, eight patients were transferred between programs; of these, four were transferred between programs during a single episode of care (one of whom also had multiple episodes of care), and four patients had multiple distinct episodes of care in both ED and NSSI programs; all of these patients were classified as "co-occurring ED and NSSI." Twelve patients in the ED program were missing NSSI data and were excluded from the sample.

The final sample ($N = 648$) was 85.8% female, with 28 individuals (4.3%) missing sex data. The sample included 172 participants identified as ED-only, 319 participants identified as NSSI only, and 157 participants identified as co-occurring ED and NSSI (79 with primary ED; 78 with primary NSI). The ED-only and co-occurring ED and NSSI groups included patients with AN ($n = 63$), BN ($n = 58$), BED ($n = 17$),

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