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## Non-Suicidal Self-Injury and Suicidal Ideation in Relation to Eating and General Psychopathology Among College-Age Women

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### Abstract

Non-suicidal self-injury (NSSI) and suicidal ideation are potent risk factors for suicide and are associated with general and eating disorder-specific psychopathology. Limited research has examined the effects of combined NSSI+suicidal ideation thus concurrent examination is needed to understand potential differential effects on psychopathology. College-aged women ( $N=508$ ) completed self-report measures of NSSI, suicidal ideation, general psychopathology, and eating disorder-specific psychopathology. MANOVAs determined whether the NSSI/Suicidal Ideation status groups differed on general and eating disorder pathology measures as a set. Significant MANOVAs were followed up with univariate ANOVAs and posthoc tests. Thirteen women endorsed NSSI+Suicidal Ideation, 70 endorsed NSSI-only, 25 endorsed Suicidal Ideation-only, and 400 endorsed no NSSI/Suicidal Ideation. Both general and eating disorder-specific psychopathology differed across groups. NSSI+Suicidal Ideation and Suicidal Ideation-only groups typically endorsed higher general psychopathology than the no NSSI/Suicidal Ideation and NSSI-only groups. Regarding eating disorder pathology, the NSSI+Suicidal Ideation group was more pathological than no NSSI/Suicidal Ideation and NSSI-only, except on the weight concerns scale, where NSSI+Suicidal Ideation only differed from no NSSI/Suicidal Ideation. The NSSI +Suicidal Ideation group was only greater than Suicidal Ideation-only on measures of depression and eating concern. Results highlight the importance of screening for both NSSI and suicidal ideation, especially for individuals with eating disorder symptoms. Likewise, screening for eating disorder pathology may be beneficial for individuals presenting with NSSI and suicidal ideation.

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## Keywords

suicide; eating disorders; depression; comorbidity

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## 1. Introduction

Non-suicidal self-injury (NSSI) and suicidal ideation are potent risk factors for suicide that warrant collective exploration (Reinherz et al., 2006; Hamza et al., 2012). NSSI, which has 4–6% lifetime and 0.9% 12-month prevalence among community-sampled adults (Klonsky, 2011), refers to deliberate, self-inflicted harm or alteration of one's body without suicidal intent (Nock and Favazza, 2009). Although NSSI by definition occurs without suicidal intent, a history of NSSI is one of the strongest predictors of attempted suicide (Hamza et al., 2012; Groschwitz et al., 2015). Suicidal ideation involves thoughts of or making plans to end one's life (Nock, 2010). Depending on how measured (e.g., "thoughts about death," having a plan), rates of suicidal ideation among non-clinical adult samples range from up to 12% who report having a suicide plan to up to 21% who report thoughts of ending of their life; ideation including a plan is more likely to lead to a suicide attempt than ideation without a plan (Nock et al., 2008).

NSSI and suicidal ideation are important constructs to evaluate together, as patients endorsing both may have more severe psychiatric profiles and be at higher risk for death, therefore warranting different treatment recommendations. In a meta-analysis exploring risk factors that predict suicide attempt among individuals who engage in NSSI, suicidal ideation was the strongest predictor of an attempt (Victor and Klonsky, 2014), suggesting that individuals who engage in NSSI who also endorse suicidal ideation are at increased risk for a suicide attempt. However, only a few studies have actually compared groups of individuals endorsing versus denying NSSI and/or suicide attempts (i.e., no NSSI or suicide attempt, NSSI without a history of a suicide attempt, suicide attempt without NSSI, both NSSI and a suicide attempt) (Muehlenkamp and Gutierrez, 2007; Jacobson et al., 2008, Brausch and Gutierrez, 2010). Research has indicated that individuals with no history of NSSI or a suicide attempt exhibited fewer risk factors (e.g., depression symptoms) and greater protective factors (e.g., higher self-esteem) compared to individuals endorsing one or both constructs (Muehlenkamp and Gutierrez, 2007; Brausch and Gutierrez, 2010). Importantly, individuals endorsing both NSSI and a suicide attempt had greater suicidal ideation and depressive symptoms than those who only endorsed NSSI, suggesting NSSI+suicide attempt may represent a different group than NSSI alone (Muehlenkamp and Gutierrez, 2007; Brausch and Gutierrez, 2010). Another study showed that among adolescents participating in outpatient psychiatric care, those with NSSI only had similar levels of depressive symptoms and suicidal ideation compared to individuals with no NSSI and no suicide attempts (Jacobson et al., 2008). Taken together, results suggest psychiatric differences exist between individuals with NSSI-only versus individuals with NSSI *and* suicidal behavior. However, to the authors' knowledge, no study has compared individuals on the basis of NSSI and suicidal ideation—a potent risk factor for predicting the development of suicidal attempts among individuals with NSSI—to endorsement of neither or either of these constructs, and few studies differentiate how NSSI in combination with some type of

suicidal intent relates to other psychopathology (Hamza et al., 2012). Ascertaining whether the combined presence of NSSI and suicidal ideation indicates greater overall psychopathology than endorsement of either construct alone may better inform suicide prevention. Further, exploring associations between NSSI, suicidal ideation, and comorbid psychopathology may improve treatment decision-making and intervention targets.

Individuals with eating disorders represent a specific population with increased rates of NSSI, suicide attempts, and suicide completions (Keel et al., 2003; Franko and Keel, 2006; Kostro et al., 2014). Indeed, among individuals with clinical eating disorders, those who engage in NSSI and suicide attempts have higher rates of binge/purge symptomatology (Favaro and Santonastaso, 1996; Stein et al., 2004), and dietary restriction may be linked to suicidal behavior as well (Selby et al., 2010). Furthermore, the defining behaviors of eating disorders (e.g., self-induced vomiting, laxative or diuretic misuse, severe restriction, binge eating) may be congruent with NSSI in the sense that these behaviors are damaging to the self, cause deleterious physical consequences, and increase risk of death with continued recurrence (St. Germain and Hooley, 2012). Similarly, individuals with eating disorders who repeatedly engage in self-inflicted, painful behaviors, such as extreme starvation, may be at higher risk for suicide. In particular, individuals who repeatedly engage in behaviors that cause pain (e.g., NSSI, eating disorder behaviors) are more likely to attempt or commit suicide due to an increased tolerance to endure pain and decreased fear about the pain from repeated exposure to pain, in line with the Interpersonal-Psychological theory of suicidal behavior (Joiner, 2005).

Cognitive factors are also associated with self-injury and suicidality in individuals with EDs. Body dissatisfaction, a potent eating disorder risk factor and symptom (Stice et al., 2010), mediates the well-established relation between negative affect and NSSI (Muehlenkamp and Brausch, 2012). Furthermore, inpatients hospitalized for anorexia nervosa or a suicide attempt had greater negative attitudes and feelings towards their bodies than either a psychiatric control group or healthy controls (Stein et al., 2003). Among non-clinical community adolescents, individuals who engaged in NSSI (with or without history of a suicide attempt) had greater body dissatisfaction and disordered eating than those without NSSI or a suicide attempt (Brausch and Gutierrez, 2010). Likewise, college students who reported NSSI in the past four weeks were more likely to screen positive for a probable eating disorder (Gollust and Eisenberg, 2008). In sum, although there is significant evidence linking eating disorders, NSSI, and suicide attempts, there is a dearth of literature examining NSSI and suicidal ideation collectively in a non-clinical sample. Moreover, as college-age women represent a non-clinical group with elevated rates of body dissatisfaction, eating pathology (Eisenberg et al., 2011), NSSI, and suicidal ideation (Nock et al., 2008; Hamza et al., 2012), understanding these constructs in this population can help improve mental health care on college campuses and aid clinicians in assessing these constructs and making treatment recommendations. Further, this study may elucidate how NSSI and suicidal ideation relate to specific facets of eating disorders (e.g., weight concern, impairment related to eating).

To our knowledge, this is the first study to examine individuals with and without NSSI and with or without suicidal ideation, in college-aged women and to explore the associations

between these constructs and measures of general (e.g., depression, anxiety, stress) and eating disorder-specific psychopathology. Participants were categorized into four groups based on self-report of NSSI and suicidal ideation: no NSSI/Suicidal Ideation, NSSI-only, Suicidal Ideation-only, and NSSI+Suicidal Ideation. We hypothesized that the group endorsing both NSSI and suicidal ideation (i.e., NSSI+Suicidal Ideation) would display the highest levels of psychopathology and that the no NSSI/Suicidal Ideation group would display the lowest levels of psychopathology, based on previous literature evaluating these constructs in non-eating disorder samples. We also hypothesized that NSSI-only would demonstrate lower levels of psychopathology than NSSI+Suicidal Ideation, but due to contradictory findings in the literature, it was unclear whether NSSI would have pathology levels similar to or greater than the no NSSI/Suicidal Ideation group. Thus, no hypothesis was made for this comparison and this analysis was considered exploratory. Similarly, as little information exists regarding how Suicidal Ideation-only might compare to NSSI-only and NSSI+Suicidal Ideation, these comparisons were considered exploratory, but it was hypothesized that Suicidal Ideation-only will have greater levels of pathology compared to no NSSI/Suicidal Ideation. Understanding the relation of NSSI and suicidal ideation to general and eating disorder-specific psychopathology in college-age women may inform risk for maladjustment, recommendations for screening, and potential targets for suicide prevention.

## 2. Methods

### 2.1. Participants

A community sample of 549 women aged 18–25 years, with a body mass index (BMI) between 18–32 kg/m<sup>2</sup>, was recruited for a larger study about improving body image and mood from universities and the surrounding communities in the St. Louis, Sacramento, and San Francisco Bay areas. Exclusion criteria included no regular internet access, residency outside of the three metropolitan areas, and/or being male. Men were excluded given that women display disproportionately higher levels of body dissatisfaction (Murnen, 2011), and the larger study for which these data were collected was interested in evaluating women only. Participants had a mean age of 20.61 (*SD* = 1.97) and a mean BMI of 24.5 kg/m<sup>2</sup> (*SD* = 5.02). Over half (55.6%) the sample identified as Caucasian, 21.1% as Asian, 8.7% as African American, and 8.4% as Latino; 48.9% of the sample endorsed having a parent who had at least graduated college.

### 2.2. Measures and procedure

Participants were recruited through flyers, emails to listservs, social media, research volunteer databases, and by word of mouth. Study advertisements targeted women who had concerns about their weight or shape, who wanted to feel better about their body, and or who wanted to reduce stress or improve mood. Accordingly women were recruited who endorsed a broad range of weight and shape concerns, per the aims of the larger study. Potential participants completed an online or telephone-based screening questionnaire to assess interest in participation and ensure they met inclusion criteria (i.e., not male, had regular Internet access, lived within the study areas). A number of participants (*n* = 287) completed the screen but did not enroll in the research study due to exclusion based on eligibility

criteria or lack of interest in further study participation. Interested and eligible participants were then invited to complete an in-person visit, during which self-report questionnaires were administered including assessment of demographics (i.e., age, race/ethnicity, highest parental education). The Functional Assessment of Self-Mutilation (FASM; Lloyd et al., 1997) was used to assess the presence of NSSI. Participants endorsed whether they engaged in 11 NSSI behaviors (e.g., cut or carved skin, burned skin) within the past year. Participants who reported engaging in one or more NSSI behaviors were considered as having engaged in NSSI. Suicidal ideation was defined by a response above “0- I don’t have any thoughts of killing myself” on item nine, “Suicidal Thoughts and Wishes” on the Beck Depression Inventory-II (BDI-II; Beck et al., 1996), which measures depressive symptoms over the past two weeks.

Established measures with good psychometric properties were utilized to assess general psychopathology, and reliability for the current sample is provided: 1) the BDI-II (Beck et al., 1996) total score was imputed excluding the item assessing suicidal ideation by multiplying the average item score from the remaining 20 items by 21, so that imputed scores have the same score range as the original BDI scores SI ( $\alpha = 0.92$ ); 2) the Spielberger State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970) Trait Anxiety subscale ( $\alpha = 0.93$ ); 3) the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn and Beglin, 1994) Global score ( $\alpha = 0.93$ ); 4) the Difficulty with Emotion Regulation Scale (DERS; Gratz and Roemer, 2004) overall score ( $\alpha = 0.94$ ); 5) the Perceived Stress Scale (PSS; Cohen et al., 1983;  $\alpha = 0.89$ ); and 6) the Eating Disorder Inventory-2 (EDI-2; Garner, 1991) Perfectionism subscale ( $\alpha = 0.852$ ). Established measures with good psychometric properties were utilized to assess specific eating disorder pathology, and reliability for the current sample is provided: 1) the EDE-Q (Fairburn and Beglin, 1994) Restraint ( $\alpha = 0.74$ ), Eating Concern ( $\alpha = 0.79$ ), Weight Concern ( $\alpha = 0.80$ ), and Shape Concern ( $\alpha = 0.88$ ) subscales; 2) the EDI-2 (Garner, 1991) Drive for Thinness subscale ( $\alpha = 0.77$ ); 3) the Weight Concerns Scale (WCS; Killen et al., 1994;  $\alpha = 0.67$ )<sup>1</sup>; and 4) the Clinical Impairment Assessment (CIA; Bohn and Fairburn, 2008;  $\alpha = 0.95$ ). For all measures, higher scores reflect higher levels of psychopathology. Objective measures of height and weight were taken by trained research assistants and used to calculate BMI.

Informed consent was obtained from all participants, and the Institutional Review Boards of all participating sites approved this study.

### 2.3. Statistical analyses

Chi-square tests and one-way analyses of variance (ANOVAs) were conducted to determine whether the NSSI/SI status groups differed on any demographic variables. Multivariate ANOVAs (MANOVAs) were used to determine whether the NSSI/Suicidal Ideation status groups differed on “general psychopathology” (e.g., BDI-II, STAI-T, EDE-Q-global) and “eating disorder pathology” (e.g., EDE-Q restraint, WCS), respectively, as sets. The EDE-Q global score was categorized as a measure of general psychopathology for two reasons: 1) it

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<sup>1</sup>Both the EDE-Q Weight Concern subscale and the WCS are included as measures in this study as they evaluate different constructs. In particular, the WCS focuses more on worries about one’s body, feelings of fatness and dieting, while the EDE-Q Weight Concern subscale is more of a direct measure of concern about one’s weight (e.g., the number on the scale, desire to lose weight).

represents an overall index of eating pathology (just as the BDI and STAI Trait Anxiety subscale represent overall indices of depressive symptoms and anxiety, respectively); and 2) given that it is the average of the four EDE-Q subscales, statistically, it should not be analyzed directly with its subscales. Significant MANOVAs ( $p < .05$ ) were followed by univariate ANOVAs and Games-Howell tests to account for differences in group size (Field, 2005). The Welch statistic is reported where homogeneity of variances was violated (Field, 2005); variables were square root transformed when normality assumptions were violated.

### 3. Results

Due to missing data on NSSI or suicidal ideation measures, 41 participants were excluded from all analyses, yielding the current sample of 508 participants. Thirteen (2.6%) women endorsed both NSSI+Suicidal Ideation, 70 (13.8%) endorsed NSSI-only, 25 (4.9%) endorsed Suicidal Ideation-only, and 400 (78.7%) endorsed no NSSI/Suicidal Ideation. The four NSSI/Suicidal Ideation groups did not differ on age, BMI, race/ethnicity, or highest parental education ( $ps > 0.05$ ).

General psychopathology ( $F(18, 1372.27) = 6.86$ , Wilks' Lambda = 0.78,  $p < 0.001$ , partial  $\eta^2 = 0.078$ ) and eating disorder-specific psychopathology ( $F(21, 1424.79) = 2.59$ , Wilks' Lambda = 0.898,  $p < 0.001$ , partial  $\eta^2 = 0.035$ ) significantly differed across groups. To delineate group differences, univariate and subsequent posthoc tests comparing groups among participants who completed were performed for each of the individual variables (see Table 1). Variation in the number of participants in the statistical tests (as indicated by the varying degrees of freedom) is due to a few individual participants missing data on the various study measures. All individual measures of general and eating disorder-specific psychopathology significantly differed across groups, except for measures of perfectionism and dietary restraint. Where differences existed in general psychopathology, the NSSI +Suicidal Ideation and Suicidal Ideation-only groups endorsed higher general psychopathology than the no NSSI/Suicidal Ideation and NSSI-only groups, except on global eating disorder pathology, where each group was higher than the no NSSI/Suicidal Ideation group. Additionally, the NSSI+Suicidal Ideation group endorsed higher depressive psychopathology compared to the Suicidal Ideation-only group. In measures of eating disorder pathology, the NSSI+Suicidal Ideation group was always more pathological than no NSSI/Suicidal Ideation and NSSI-only groups, except on the WCS, where the NSSI +Suicidal Ideation group only differed from the no NSSI/Suicidal Ideation group. The NSSI +Suicidal Ideation group also differed from the Suicidal Ideation-only group on the Eating Concern subscale.

### 4. Discussion

Borrowing analytic strategies from past research examining individuals with or without NSSI and individuals with or without a history of suicide attempts (Muehlenkamp and Gutierrez, 2007; Jacobson et. al., 2008, Brausch and Gutierrez, 2010), this study examined the prevalence and psychosocial correlates of individuals with or without NSSI and with or without Suicidal Ideation in a non-clinical sample consisting of college-age women. As hypothesized, the NSSI+Suicidal Ideation group demonstrated greater psychopathology on

non-eating related pathology than the no NSSI/Suicidal Ideation and NSSI-only groups wherever group differences existed. Similarly, the Suicidal Ideation-only group also demonstrated greater non-eating related psychopathology than the no NSSI/Suicidal Ideation (as hypothesized) and NSSI-only groups. Importantly, the NSSI+Suicidal Ideation group had significantly higher depression scores (which were in the severe range) than did the Suicidal Ideation group (with scores in the moderate range) (Beck et al., 1996). Clinically then, having both NSSI and Suicidal Ideation captures a very depressed group of women, much more so than those with only Suicidal Ideation. Interestingly, on measures of “general psychopathology”, the NSSI-only group did not differ from the No NSSI/Suicidal Ideation group except for global eating disorder pathology.

Global eating disorder pathology showed a different pattern of results, with the NSSI +Suicidal Ideation, NSSI-only, and Suicidal Ideation-only groups having higher scores than the no NSSI/Suicidal Ideation group, confirming the justification to explore more specific facets of eating disorder pathology. As hypothesized, the NSSI+Suicidal Ideation group reported greater eating disorder symptoms than the no NSSI/Suicidal Ideation and NSSI-only groups with one exception: on a measure of weight concerns (WCS), NSSI+Suicidal Ideation did not differ from NSSI-only. The Suicidal Ideation-only and NSSI-only groups were more pathological on only some measures of eating disorder pathology (i.e., the EDE-Q Shape Concern and EDE-Q Weight Concern subscales) than the no NSSI/Suicidal Ideation group. Importantly, the Suicidal Ideation-only group also had higher eating disorder-related clinical impairment compared to the no NSSI/Suicidal Ideation group. Both Suicidal Ideation-only and NSSI+Suicidal Ideation groups had mean impairment scores above the clinical cutoff score 16, which is associated with a clinical eating disorder (Bohn et al., 2008). The absence of differences between Suicidal Ideation-only and NSSI-only groups on measures of eating disorder pathology might be attributed to higher rates of eating disorder psychopathology in this sample, evidenced by average scores for most groups greater than community norms and clinical cutoffs (Jacobi et al., 2004; Luce et al., 2008). The high levels of eating disorder pathology in the current sample are likely due to participants being recruited for a study on improving body image.

Interestingly, the only constructs which did not differ across the four groups were perfectionism and dietary restraint. The perfectionism measure used was from the EDI which generates a single scale; however, research has suggested perfectionism is a multidimensional construct with some aspects that are maladaptive (e.g., striving for excessively high standards motivated by fear of failure) and some that are adaptive (e.g., striving for appropriate standards leading to satisfaction) (Bardone-Cone et al., 2007). Accordingly, it is possible that the findings may be due to choice of measure and future studies should consider exploring specific facets of perfectionism that might differentiate between the groups. Findings showing no between-group differences in dietary restraint could be due to the fact that the sample consists of women who responded to a study targeting individuals wishing to improve their body image; accordingly, women wishing to improve their body image may display similar levels of dietary restraint and may have been more likely to sign up for this study, making it difficult for differences to be detected between groups. However, an alternative explanation is that the findings may reflect that self-injurious behaviors and suicidality present differently between varying eating disorder

symptom profiles (e.g., individuals who endorse binge/purge behaviors versus restrictive behaviors are more likely to engage in NSSI and endorse SI; Favaro and Santonastaso, 1996; Stein et al., 2004); however, data from this study do not allow for these more granular comparisons in eating disorder behaviors across NSSI and Suicidal Ideation groups. Future studies should explore patterns of NSSI and suicidal ideation based on clinical eating disorder diagnoses.

These findings are in line with and expand previous research which demonstrated differences in pathology between individuals with NSSI-only versus individuals with NSSI *and* suicidal attempts. To our knowledge, no study has compared individuals on the basis of endorsing both NSSI and suicidal ideation to those endorsing only one or neither of these constructs. As suicidal ideation is a potent risk factor for predicting the development of suicidal attempts among individuals with NSSI, and few studies differentiate how NSSI in combination with some type of suicidal intent relates to other psychopathology (Hamza et al., 2012), specifically exploring suicidal ideation may better inform suicide prevention and treatment decision-making and intervention targets due to comorbidity. The importance of this novel exploration of suicidal ideation was highlighted in the differences in results between individuals with or without concurrent NSSI. The presence of suicidal ideation appears to be one distinguishing factor related to greater general psychopathology, as both the NSSI+Suicidal Ideation and Suicidal Ideation-only groups had higher levels of pathology than both the NSSI-only and no NSSI/Suicidal Ideation group (except on the EDE-Q-global where any NSSI or Suicidal Ideation was greater than no NSSI/Suicidal Ideation but no differences existed among the three groups). However, given that the added presence of NSSI was associated with clinically significant depressive scores in the severe range, compared to moderate scores in the Suicidal Ideation-only group, assessing for suicidal ideation alone may not be sufficient, as NSSI may confer additional risk for depressive symptoms. Alarming, although suicidal ideation is regularly assessed in clinical practice, NSSI is less frequently assessed; clinicians have reported feeling less prepared to address NSSI given a lack of training (Taliaferro et al., 2013). Ensuring patients' safety is of utmost clinical import, and results suggest that additional assessment of self-injurious behavior and eating disorder symptomatology may be warranted among individuals presenting with suicidal ideation or eating disorder symptoms.

Further, although those who only endorsed suicidal ideation had greater general psychopathology than individuals who only endorsed NSSI, there were no differences on any measures of eating pathology between Suicidal Ideation-only and NSSI-only, suggesting that both groups may benefit from further attention to eating disorder pathology in clinical practice. However, it is possible these findings could be due to recruitment of women with high body image concerns. Thus, future research should seek to clarify whether Suicidal Ideation-only is a different phenotype than NSSI-only across all pathology or whether these two groups are truly similar in terms of levels of eating pathology. This study extends the research that has demonstrated increased NSSI, suicidal ideation, and suicide attempts among individuals with eating disorders (Favaro and Santonastaso, 1996; Stein et al., 2004), by examining specific facets of eating disorder symptomatology in a non-clinical sample. Future research should examine whether these facets could differentiate individuals who



have and have not attempted suicide, thus helping to predict who may be at greatest risk of suicide.

#### 4.1. Limitations

Limitations of the study include the cross-sectional design, which precludes answering questions regarding causality. Additional limitations include use of a female-only sample, small group sizes for the NSSI/Suicidal Ideation and Suicidal Ideation-only groups, and no measure assessing history of suicidal attempts or endorsement of a suicide plan. Also, there were no measures of personality disorders, which might help explain group differences. Further, measurement issues represent study limitations: (1) NSSI was measured over the past year and suicidal ideation over the past two weeks; (2) suicidal ideation was only measured via a single item, which makes measurement of this construct less psychometrically stable and vulnerable to response errors; and (3) no measure of symptom validity was included. Lastly, women who wanted to improve their body image and mood were recruited for participation in the current study; thus, results may not generalize to all college-age women or to women in general. Despite these limitations, results suggest the need for further, more rigorous concurrent study of NSSI and suicidal ideation in relation to suicide risk and general and eating disorder psychopathology; specifically using a Latent Class Analysis approach might elucidate how different combinations are associated with various psychopathology.

#### 4.2. Conclusions

Results demonstrate that women with suicidal ideation (with or without NSSI) exhibited greater general psychopathology compared to women without suicidal ideation. Furthermore NSSI+ Suicidal Ideation are associated with severe depressive symptoms, highlighting the importance of improving current clinical practice standards and regularly screening for both constructs. In contrast, the combination of NSSI+Suicidal Ideation was associated with the greatest eating disorder pathology, which suggests screening for both NSSI and suicidal ideation when individuals present with eating disorder symptoms and screening for eating disorder symptoms when NSSI or suicidal ideation are endorsed.

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### Highlights

- First study to compare groups of women who engaged in NSSI, Suicidal Ideation, both, or neither.
- Suicidal Ideation +/- NSSI was associated with greater general psychopathology than NSSI alone.
- NSSI+Suicidal Ideation had higher eating disorder psychopathology than NSSI- or Suicidal Ideation-only.
- NSSI+Suicidal Ideation was associated with a higher, clinical level of depression than SI-only.
- NSSI, Suicidal Ideation, and Eating Disorder pathology screening may be useful when one construct is endorsed.

**TABLE 1**  
Comparison of general and eating disorder psychopathology across non-suicidal self-injury and suicidal ideation groups

	No NSSI/Suicidal Ideation Group 1 (n=400) Mean (SD)	NSSI-Only Group 2 (n=70) Mean (SD)	Suicidal Ideation-Only Group 3 (n=25) Mean (SD)	NSSI+Suicidal Ideation Group 4 (n=13) Mean (SD)	Significance	Pairwise Comparisons
BDI-II <sup>ab</sup>	8.88 (7.95)	10.86 (8.08)	22.80 (7.62)	32.15 (9.67)	Wald's $F(3, 42.21) = 78.51; p < 0.001; \omega^2 = 0.317$	4 > 1, 2, 3 3 > 1, 2
STAI Trait Anxiety	40.57 (10.72)	43.05 (11.48)	54.67 (9.57)	58.22 (10.86)	$F(3, 499) = 23.42; p < 0.001$ partial $\eta^2 = 0.123$	4 > 1, 2 3 > 1, 2
EDE-Q Global	2.11 (1.07)	2.53 (1.07)	2.70 (0.99)	3.44 (1.07)	$F(3, 504) = 10.88; p < 0.001$ partial $\eta^2 = 0.061$	4, 3, 2 > 1
DERS <sup>a</sup>	76.16 (19.88)	82.93 (20.93)	101.52 (19.92)	117.04 (18.23)	$F(3, 503) = 27.43; p < 0.001$ partial $\eta^2 = 0.141$	4 > 1, 2 3 > 1, 2
PSS	16.86 (6.57)	18.87 (6.03)	24.12 (5.59)	25.77 (5.92)	$F(3, 502) = 18.09; p < 0.001$ partial $\eta^2 = 0.098$	4 > 1, 2 3 > 1, 2
EDI-2 Perfectionism	4.09 (1.15)	4.24 (1.10)	4.21 (1.19)	4.22 (1.23)	$F(3, 503) = 0.43; p = .74$ partial $\eta^2 = 0.003$	-
EDE-Q Restraint	2.00 (1.29)	2.30 (1.19)	2.24 (1.26)	2.35 (1.57)	$F(3, 504) = 1.54; p = 0.21$ partial $\eta^2 = 0.009$	-
EDE-Q Eating Concern <sup>a</sup>	1.08 (1.03)	1.45 (1.15)	1.65 (1.04)	2.78 (1.17)	$F(3, 504) = 12.41; p < 0.001$ partial $\eta^2 = 0.069$	4 > 1, 2, 3 2 > 1
EDE-Q Shape Concern	2.89 (1.34)	3.38 (1.44)	3.68 (1.17)	4.50 (1.02)	$F(3, 504) = 10.32; p < 0.001$ partial $\eta^2 = 0.058$	4, 3, 2 > 1 4 > 2
EDE-Q Weight Concern	2.46 (1.35)	3.00 (1.31)	3.26 (1.22)	4.11 (1.06)	$F(3, 504) = 11.12; p < 0.001$ partial $\eta^2 = 0.062$	4, 3, 2 > 1 4 > 2
EDI-2 Drive for Thinness	3.42 (0.97)	3.67 (0.93)	3.93 (1.05)	4.45 (0.73)	$F(3, 504) = 7.58; p < 0.001$ partial $\eta^2 = 0.043$	4 > 1, 2
WCS	54.27 (19.75)	60.24 (17.53)	62.47 (17.34)	72.95 (17.02)	$F(3, 504) = 6.48; p < 0.001$ partial $\eta^2 = 0.037$	4 > 1
CIA <sup>a</sup>	10.41 (9.15)	12.79 (9.27)	17.12 (9.19)	26.42 (11.06)	$F(3, 502) = 12.90; p < 0.001$ partial $\eta^2 = 0.072$	4 > 1, 2 3 > 1

Note. NSSI = non-suicidal self-injury; BDI-II = Beck Depression Inventory-II; STAI = Spielberger State-Trait Anxiety Inventory; EDE-Q = Eating Disorder Examination-Questionnaire; DERS = Difficulty with Emotion Regulation Scale; PSS = Perceived Stress Scale; EDI-2 = Eating Disorder Inventory-2; WCS = Weight Concerns Scale; CIA = Clinical Impairment Assessment. For all measures, higher scores reflect higher levels of the construct. Pairwise comparisons listed were significant at least at  $p < 0.05$ .

<sup>a</sup>Variables were Square Root Transformed for normality adjustment and used for significance testing but true means are presented for interpretation purposes.

<sup>b</sup>BDI scores were imputed by multiplying the average item score for the 20 items excluding the suicidal ideation item and multiplied by 21.