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ORIGINAL ARTICLE

Comparing self-harming intentions underlying eating disordered behaviors and NSSI: Evidence that distinctions are less clear than assumed

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Abstract

Objective: Eating disordered (ED) behaviors (i.e., binge eating, compensatory behaviors, restrictive eating) and nonsuicidal self-injury (NSSI; intentional and nonsuicidal self-harm) are highly comorbid and share several similarities, including consequent pain and physical damage. However, whereas NSSI is considered direct self-harm, ED behaviors are considered indirect self-harm. These distinctions stem from theoretical understanding that NSSI is enacted to cause physical harm in the moment, whereas ED behaviors are enacted for other reasons, with consequent physical harm occurring downstream of the behaviors. We sought to build on these theoretically informed classifications by assessing a range of self-harming intentions across NSSI and ED behaviors.

Method: Study recruitment was conducted via online forums. After screening for inclusion criteria, 151 adults reported on their intent to and knowledge of causing physical harm in the short- and long-term and suicide and death related cognitions and intentions when engaging in NSSI and specific ED behaviors.

Results: Participants reported engaging in ED and NSSI behaviors with intent to hurt themselves physically in the moment and long-term, alongside thoughts of suicide, and with some hope and knowledge of dying sooner due to these behaviors. Distinctions across behaviors also emerged. Participants reported greater intent to cause physical harm in the moment via NSSI and in the long-run via restrictive eating. NSSI and restrictive eating were associated with stronger endorsement of most suicide and death-related intentions than binge eating or compensatory behaviors.

Conclusions: Findings shed light on classification of self-harming behaviors, casting doubt that firm boundaries differentiate direct and indirectly self-harming behaviors.

KEYWORDS

binge eating, direct self-harm, eating disorder, indirect selfharm, nonsuicidal self-injury, purging, restrictive eating, suicide

1 | INTRODUCTION

Several lines of research highlight a strong relationship between eating disordered (ED) behaviors (i.e., binge eating, restrictive eating, and compensatory behaviors) and nonsuicidal self-injury (NSSI; i.e., direct and intentional self-harm, enacted without suicidal intent, and resulting in tissue damage; Nock, 2010). First, NSSI and ED behaviors frequently co-occur. A recent meta-analysis indicated that approximately 27% of individuals diagnosed with anorexia nervosa or bulimia nervosa report lifetime NSSI engagement (Cucchi et al., 2016), and between a quarter to a half of people engaging in NSSI report comorbid disordered eating (Gollust, Eisenberg, & Golberstein, 2008; Heath, Toste, Nedecheva, & Charlebois, 2008). Second, both ED behaviors (Hudson et al., 2008) and NSSI (Nock, 2009) have a typical age of onset in adolescence, suggesting a potentially shared etiology. Third, ED behaviors (Smith, Zuromski, & Dodd, 2018) and NSSI (Andover, Morris, Wren, & Bruzzese, 2012; Hamza, Stewart, & Willoughby, 2012) often co-occur with suicidal thoughts and behaviors. Fourth, similar cognitive and affective mechanisms are involved in the risk and maintenance of ED and NSSI behaviors (Buckholdt et al., 2015; Wang,

Pisetsky, Skutch, Fruzzetti, & Haynos, 2018). Taken together, the existing literature indicates high co-occurrence of ED behaviors and NSSI, as well as considerable mechanistic similarity between these behaviors.

2 | DIRECT VERSUS INDIRECT SELF-HARM

NSSI and ED behaviors are classified as direct and indirectly self-harming behaviors, respectively (Claes & Muehlenkamp, 2014; Favazza, DeRosear, & Conterio, 1989; Laye-Gindhu & Schonert-Reichl, 2005; Møhl, Cour, & Skandsen, 2014; St. Germain & Hooley, 2012, 2013). NSSI is defined as direct self-harm because the physical harm inflicted is intentional and because it occurs immediately after the behavior (e.g., blood/wound immediately after self-cutting; Nock & Favazza, 2010). ED behaviors, in contrast, are classified as *indirect* self-harm because (1) they are believed to have other (not self-harming) primary motivations and (2) because they are considered to cause physical harm *downstream* of the behavior itself (Claes & Muehlenkamp, 2014; Favazza et al., 1989; Laye-Gindhu & Schonert-Reichl, 2005; Møhl et al., 2014; St. Germain & Hooley, 2012, 2013). In line with this current classification system, prevailing theories suggest that ED behaviors are enacted primarily to control weight and shape or to serve other functions, such as to regulate emotions or to manage self-discrepancies, rather than as a means to harm oneself (Fairburn, Cooper, & Shafran, 2003; Haynos & Fruzzetti, 2011; Wang et al., 2018). Moreover, bodily harm resulting from ED behaviors are typically studied in the context of repeated engagement over an extended period (e.g., osteoporosis after months/years of restrictive eating).

Building on these classification schemes, researchers have examined similarities and differences between direct and indirect forms of self-harm, lumping ED behaviors with other indirectly harmful behaviors (e.g., engagement in abusive relationships, excessive drug/alcohol use; St. Germain & Hooley, 2012, 2013). Results of such work have led to the conclusion that NSSI and indirectly harmful behaviors are similarly related to psychopathology and aberrant pain perception (St. Germain & Hooley, 2013) but that NSSI is more strongly related to self-criticism and to suicide proneness (St. Germain & Hooley, 2012). Perhaps relatedly, clinically, these preliminary classifications may have led clinicians to aberrantly assume that ED behaviors are not strongly related to self-injurious behaviors. For example, Peebles, Wilson, and Lock (2011) reviewed charts of approximately 1,500 patients with eating disorders and found that providers screened for NSSI in <50% of all cases, and even less frequently for patients who only engaged in restricting (without binge eating/purging).

However, several lines of empirical evidence are contrary to this current classification system. ED behaviors may actually involve self-harming motivations for some people and/or in some situations. Providing support for this possibility, some people who engage in ED behaviors report high levels of self-criticism and a desire to self-punish via these behaviors (Svirko & Hawton, 2007). When separating ED behaviors from other indirect forms of self-harm, NSSI and ED behaviors show similarly strong associations with self-criticism (Zelkowitz & Cole, 2018). Moreover, substantial comorbidity between NSSI and ED behaviors, alongside evidence that ED behaviors can co-occur with NSSI (i.e., within an episode; Shingleton et al., 2013; Turner, Yiu, Claes, Muehlenkamp, & Chapman, 2016), suggests that there may be some shared intent to harm oneself via NSSI and ED behaviors. Indeed, ED behaviors can be painful (Selby et al., 2010; Smith et al., 2013), can result in substantial physical damage over both the short- and longer-term (e.g., Claes & Muehlenkamp, 2014; Møhl et al., 2014; St. Germain & Hooley, 2012), and there is preliminary evidence that some people spontaneously categorize ED behaviors as a form of self-harm (e.g., Laye-Gindhu & Schonert-Reichl, 2005). Finally, although NSSI inherently involves intentional self-harm (items assessing these behaviors typically ask, "Have you ever purposely hurt yourself without the intent to die?"; Nock, Holmberg, Photos, & Michel, 2007), the majority of people engaging in NSSI report multiple unique functions for these behaviors, including emotion regulation (Taylor et al., 2018). Therefore, just as intent to cause physical harm may not be the primary motivation for NSSI behaviors, controlling weight and shape, regulating emotions, and managing self-discrepancies may not be the only or primary motivations for ED behaviors. There may motivation to cause harm via these behaviors, as well.

To clarify these inconsistencies, assessment of self-harming intentions across NSSI and ED behaviors is needed. If people report engaging in ED behaviors *without* the intent to hurt themselves physically in the short- or long-term, results would provide support for suppositions that these behaviors are only "indirectly" harmful. That is, results would suggest that the harm elicited from ED behaviors is unintentional, and simply a secondary consequence of these behaviors. Such results would not necessitate updating current conceptualizations of direct versus indirect self-harming behaviors. Similarly, if people report only intent to hurt themselves physically over the longer- but not shorter-term, or if people only report that they know that these behaviors are harmful but they do not endorse self-harming intentions, results would also provide support that ED behaviors are indirectly harmful. However, if people report engaging in ED behaviors with some intent to hurt themselves physically in the moment, results would suggest that our current assumptions may be inaccurate, and that some indirect and directly harmful behaviors (e.g., ED behaviors, NSSI) may not represent entirely separate classes of behavior. Such findings would indicate that asking about self-harming intentions across ED behaviors may be important for accurate clinical assessment and for identifying novel, or person-specific treatment targets. Results would also shed light on one pathway through which NSSI and ED behaviors are comorbid.

3 | SUICIDAL VERSUS NONSUICIDAL INTENTIONS

NSSI and ED behaviors are both traditionally assumed to lack suicidal intent (i.e., both behaviors are labeled nonsuicidal). However, there is again some evidence that such a firm assumption may be misguided. Although NSSI is nonsuicidal by definition, emerging evidence suggests that NSSI may be enacted in the context of suicidal cognitions and intent. For example, some people who engage in NSSI report concurrent thoughts of suicide and non-zero—though still quite low—intent to die from these behaviors (Fox, Millner, & Franklin, 2016). This suggests that at least some ostensibly "nonsuicidal" behaviors

may be accompanied by desire and perhaps even intent to die from the behaviors. Such overlaps blur firm distinctions between "suicidal" and "nonsuicidal" self-harming behaviors, and may also help explain why NSSI is one of the strongest risk factors for future suicidal behaviors (Ribeiro et al., 2016).

The extent to which similar thoughts of suicide and suicidal intent are present during ED behaviors is unclear. High rates of all-cause mortality due to ED behaviors (Arcelus, Mitchell, Wales, & Nielsen, 2011) have traditionally led these behaviors to be considered indirect self-destructive behavior (e.g., Nelson & Farberow, 1980) or those that are enacted for a variety of reasons *excluding* an intent to die, but that eventually lead to injury and premature death (Conwell, Pearson, & DeRenzo, 1996). However, qualitative reports indicate that at least some individuals with an ED express an active desire for their symptoms to ultimately lead to death (Nordbø, Espeset, Gulliksen, Skårderud, & Holte, 2006). This research suggests that ED behaviors may, at least in some cases or to some degree, be enacted with an intent to die or to cause premature death. Neither direct nor indirect suicidal intentions have been examined in the context of ED behaviors. If people report that suicidal thoughts and intentions are absent when engaging in ED behaviors, results would support the classification of these behaviors as "indirectly self-destructive." However, if people report suicidal thoughts and intentions, to any degree, when engaging in ED behaviors, results would suggest that this classification may be overly simplistic.

The principle goal of the present study was to explore similarities and differences between NSSI and ED behaviors, particularly probing assumptions about self-reported direct and indirect, and suicidal and nonsuicidal, intentions when engaging in ED behaviors and NSSI. We had four specific aims: (1) to examine whether people report knowledge of and/or intent to self-harm physically in the short- and in the longer-term from NSSI and specific ED behaviors (i.e., restrictive eating, binge eating, compensatory behaviors); (2) to compare reports of self-harming knowledge and intentions across specific ED behaviors and NSSI; (3) to explore whether people report thinking about suicide while engaging in specific ED behaviors and NSSI, and whether they engage in these behaviors with the hope, knowledge, or intent to die sooner as a consequence of these behaviors; and (4) to provide a preliminary comparison of reports of these death and suicide related variables across specific ED behaviors and NSSI.

4 | METHOD

4.1 | Procedures

We recruited participants from online forums related to psychopathology, EDs, and NSSI. We contacted 18 forum moderators on Reddit.com, briefly delineating study information and asking to post a study advertisement. After obtaining approval from six forum moderators (e.g., reddit.com/r/eating_disorders, reddit.com/r/mentalhealth) we posted study advertisements briefly outlining study components (i.e., 45-min online survey), participant confidentiality, and compensation of $10 in gift cards to Amazon. Interested forum members completed a brief screening questionnaire to determine eligibility (age ≥ 18 years, English speaking, reporting 2+ episodes of NSSI, binge eating, restrictive eating, and/or compensatory behaviors within the past month). "Filler items" were also used to obscure inclusion criteria and decrease the likelihood of people misrepresenting their eligibility to gain entrance into the study. As with earlier studies using similar recruitment methods (e.g., Fox et al., 2016; Franklin et al., 2016), we asked that participants use email addresses that did not contain identifiable information (e.g., surname, date of birth) to protect participant anonymity. After completing the study screener (n = 459), 36.82% (n = 169) participants who qualified for the study completed the study questionnaires using Qualtrics. The final sample included 151 participants (89.35%), each of whom had unique IP addresses, completed all study measures, and reported a past month history of ED or NSSI behaviors during both the screening survey and the study.

4.2 | Questionnaires

4.2.1 | Eligibility questionnaire

The Eligibility questionnaire contained items asking about past month and lifetime NSSI episodes using wording drawn from the Self-Injurious Thoughts and Behaviors Interview (Nock et al., 2007) with the additional phrasing that participants "please only include those times that drew blood or left a mark lasting for at least a few days." We then used an adapted version of the Dietary Restriction Screener (Haynos & Fruzzetti, 2015) to assess engagement in restrictive eating within the past month and year. We used items adapted from the Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 2008; described in more detail below) to assess binge eating (i.e., "How many times have you eaten what other people would regard as an unusually large amount of food [given the circumstances] AND had a sense of lost control over your eating?") and compensatory behaviors (i.e., "How many times have you done any of the following as a means of controlling your shape or weight: made yourself sick [e.g., vomited], taken laxatives, exercised in a 'driven' or 'compulsive' way?") within the past year and past month. Only responses to past month items were used to determine eligibility. The questionnaire also included items about frequency of risky sexual behavior and drug/alcohol use in the past month and year to decrease the likelihood that participants would discern exact inclusion criteria. This information was not included in the analyses for this study.

4.2.2 | Eating disorder examination-questionnaire

The EDE-Q includes 28 items assessing ED psychopathology (e.g., "On how many of the past 28 days have you gone for long periods of time [8 waking hours or more] without eating anything at all in order to influence your shape or weight?"; Fairburn & Beglin, 2008). Items are rated on a scale from 0 (no days) to 6 (every day). The EDE-Q also includes six additional items that provide frequency data on ED behaviors, including objective binge-eating episodes and compensatory behaviors. The EDE-Q has demonstrated strong validity (Berg, Peterson, Frazier, & Crow, 2012) and test–retest reliability (Rose, Vaewsorn, Rosselli-Navarra, Wilson, & Weissman, 2013). The EDE-Q was used to assess severity and frequency of ED behaviors. In the present study, the EDE-Q had good internal consistency (Cronbach's alpha = 0.84).

4.2.3 | Immediate and longer-term consequences from ED behaviors and NSSI

We created a brief measure to assess relevant self-harming characteristics across average episodes of NSSI and ED behaviors (see Supporting Information Figure S1). Using a Likert-type scale from 0 (not at all) to 6 (extremely), we asked participants to answer how often they engage in the indicated behavior for the following reasons: (1) "To hurt your body physically *in the moment*;" (2) "With the **knowledge** that you'll hurt your body physically *in the moment*;" (3) "To hurt your body physically *in the long run*;" and (4) "With the **knowledge** that you'll hurt your body physically *in the long run*." These items allowed for assessment of underlying assumptions of direct and indirect self-harming distinctions. Whereas intention to cause harm in the moment is consistent with direct self-harming definitions, intentions to cause self-harm in the long-run and knowledge of causing physical harm in the short- or long-run would be consistent with indirect self-harming definitions, with the latter representing incidental (rather than intentional) self-harm. Collectively, these items will be referred to as "self-harming knowledge and intentions across ED behaviors and NSSI" throughout the manuscript.

To assess suicide and death related cognitions and intentions, participants were asked, (1) "How much do you **think about suicide"** when engaging in the indicated behavior; (2) "How much do you think about **doing this *to* kill yourself**;" and (3) "How confident are you that **doing this *could* kill you."** For the purposes of the present study, these will be termed suicidal thoughts, intent, and lethality, respectively. Regarding indirect suicidal intentions, participants were asked how often they engaged in the indicated behavior: (1) "With the **hope** that you'll die sooner than you would if you didn't do this;" and (2) "With the **knowledge** that you'll die sooner than you would if you didn't do this." These items will be termed "suicide and death related cognitions and intentions via ED behaviors and NSSI" throughout the manuscript.

4.3 | Data analysis

We examined descriptive characteristics of our sample to determine whether participants were comparable to those in other studies in terms of average scores on the EDE-Q. Next, we conducted analyses to preliminarily assess the validity of items within the immediate and longer-term consequences from ED and NSSI behaviors questionnaire. Specifically, Paired-Samples T-tests were conducted to ensure that participants understood distinctions across similar scale items (e.g., how often did you engage in [insert behavior] to hurt your body physically *in the moment* versus how often did you engage in [insert behavior] with the ***knowledge*** that you'll hurt your body physically *in the moment*). Additionally, correlations across self-harming *knowledge* and self-harming *intentions* within and between NSSI and ED behaviors were conducted to test whether these were interpreted as distinct questions.

We conducted One-Sample *T*-tests to assess whether mean scores on each relevant item in the Immediate and Longer-Term Consequences from ED Behaviors and NSSI questionnaire were significantly different from zero (i.e., the lowest possible score, indicating "never"). One-Sample T-tests tend to be robust to non-normal data; however, because our dependent variables were on an ordinal scale and because they were not normally distributed (Shapiro Wilke's tests indicated *P*'s < .01), we also ran all analyses using One-Sample Wilcoxon Signed Rank Tests. Significance levels between these tests were identical, so only results of the One-Sample *T*-tests are reported here. Results of the One-Sample Wilcoxon Signed Rank Tests are available on request.

Finally, to examine whether items were significantly different across all behaviors (i.e., restrictive eating, binge eating, compensatory behaviors, NSSI) and to account for correlations across items and interdependencies across participants, we conducted two Linear Mixed Effects Models to examine the relationship between (1) type of self-harming behavior and self-reported self-harming knowledge and intentions and (2) type of self-harming behavior and suicide and death related cognitions and intentions. In each model, self-harming behavior, self-harming intentions and knowledge *or* suicide and death related cognitions, and the interaction of the two were entered as fixed effects. Behavior and item outcome were entered as random effects. We used models including random slopes because, in both cases, results indicated that the models with random slopes were a better fit to the data than models with fixed slopes (*P*'s < .001). To determine whether the interaction improved model fit, we used a likelihood ratio test to compare the model with the interaction to the model without the interaction effect. To test for differences in responses across behavior type, we conducted post-hoc Holm corrected tests. Analyses were conducted in R (R Core Team, 2012) using the lme4 (Bates et al., 2015), lsmeans (Lenth, 2016), sjPlot (Lüdecke, 2016), and ggplot2 (Wickham, 2009) packages.

5 | RESULTS

5.1 | Participant characteristics

A total of 151 adults, ages 18–44 (*M* = 24.13, *SD* = 5.58) years were included in the study. Most participants were female (79.5%). Of note, 80 participants reported engaging in two or more unique ED behaviors in the past month (*n* = 135 reported 2+ past month episodes of restrictive eating; *n* = 97 reported 2+ past month episodes of binge eating; *n* = 51 reported 2+ past month episodes of compensatory behaviors) and 54 reported both 2+ ED behaviors and 2+ NSSI episodes in the past month. However, *most* participants reported a lifetime history of both NSSI and ED behaviors: 90.1% reported lifetime NSSI, 96% reported lifetime restrictive eating, 86.8% reported lifetime binge eating, and 74.8% reported lifetime compensatory behaviors.

Of participants endorsing lifetime NSSI engagement, the majority reported self-cutting (84.9%), self-hitting (63.0%), and scraping the skin to the point of drawing blood (50.4%). Participants also reported burning (37.8%), self-biting until drawing blood or leaving a mark (33.6%), and inserting objects under the skin (25.2%). Summing across episodes of cutting, hitting, burning, scraping skin to the point of blood, and inserting objects under the skin, participants reported 4.79 (*SD* = 7.96) past month, 42.01 (*SD* = 77.54) past year, and 326.61 (*SD* = 504.43) lifetime NSSI episodes. ED severity was high among participants reporting lifetime ED behaviors (147/151 participants). Mean global EDE-Q scores were 4.95 (*SD* = 1.51). This score is

comparable to EDEQ global scores observed in populations seeking treatment for EDs (Aardoom et al., 2012).

5.2 | Validity of the immediate and longer-term consequences from ED behaviors and NSSI questionnaire

Paired Samples *T*-tests revealed significant differences between self-harming intent and knowledge of physical harm, both in the short- and long-term across restrictive eating, binge eating, and compensatory behaviors. However, regarding NSSI, no significant differences emerged between self-reported intent to and knowledge of physical harm in the short-term, with significant differences only emerging in the long-run (see Supporting Information Table S3). In other words, there were significant differences in the knowledge of potential physical harm compared to the self-reported intent to cause physical harm via all behaviors over the long-term, and all ED behaviors over the short-term. Correlations across self-harming knowledge and intentions within and between NSSI and ED behaviors across short- and longer-term time frames were moderate (*rs* hovering around 0.5) within behaviors. Between-variable associations were weaker, suggesting that self-harming intentions differed across behaviors (see Supporting Information Table S4).

5.3 | Self-harming knowledge and intentions across ED behaviors and NSSI

One-Sample *T*-tests revealed that all scale items were significantly different from 0, the lowest possible score on the scale, suggesting an above zero presence of these thoughts and intentions (see Table 1). Results suggest that, across each ED behavior and NSSI, participants reported some *intent* to hurt themselves physically in the moment and in the long-run, as well as some *knowledge* of hurting themselves physically in the moment and in the long-run via each of these behaviors.

5.4 | Suicide and death related cognitions and intentions via ED behaviors and NSSI

Again, One-Sample *T*-tests revealed that all scale items were significantly different from 0, the lowest possible score on the scale. This indicates an above zero presence of these thoughts and intentions (see Table 1). In other words, across each ED behaviors and NSSI, participants reported suicidal thoughts, intentions, lethality, and both hope and knowledge that they would die prematurely because of these behaviors. Although these values exceeded scores of "never," average scores were quite low for some items, particularly regarding thoughts of engaging in binge eating and compensatory behaviors "to kill yourself" (see Table 1 for exact scores).

5.5 | Comparisons of self-harming knowledge and intention across ED behaviors and NSSI

Results of the first linear mixed model analyses are shown in Supporting Information Table S1. The likelihood ratio test indicated that including the interaction of behavior and item outcome significantly improved the model $\chi^2(9) = 407.75$, $P < .001$. The intra-class correlation (ICC) from this random effects model, including the interaction of behavior and outcome, (ICC = 0.600) suggested that 60% of the variability in intentions/knowledge was due to person-to-person variation (i.e., variation across people within all behavior categories) whereas 40% of the variability was due to behavior-to-behavior variation (i.e., variation within people). However, it is important to note that interpretation of ICC for models with random slopes or intercepts may be less straightforward than standard interpretations of ICC values, such that the ICC may differ at each unit of the predictor. As such, this value should be interpreted with caution.

Least square mean responses and confidence intervals are plotted in Figure 1 and corrected pairwise comparisons are listed in Table 2. Participants were more likely to report engaging in NSSI to and with the knowledge that they would hurt themselves *physically in the moment* compared to any ED behavior. In contrast, participants were more likely to report engaging in restrictive eating to hurt themselves *physically in the long run* relative to any other behavior. Participants also reported greater knowledge of long-term physical harm via restrictive eating than via NSSI and binge eating, and greater knowledge of long-term harm via compensatory behaviors than binge eating, but not NSSI. No significant differences between compensatory behaviors and restrictive eating nor between NSSI and binge eating emerged in terms of long-term harm.

5.6 | Comparisons of suicide and death related cognitions and intentions via ED behaviors and NSSI

Results of the second linear mixed model analyses are shown in Supporting Information Table S2. Results of the likelihood ratio test indicated that including the interaction of behavior and item outcome significantly improved the model $\chi^2(12) = 197.97$, $P < .001$. The *ICC* (ICC = 0.581) from the random slopes model, including the interaction of behavior and outcome, indicated that 58.1% of the variability in hopes/knowledge was due to person-to-person variation whereas 41.9% of the variability was due to behavior-to-behavior variation. Again, however, this ICC should be interpreted with caution.

Least square mean responses and confidence intervals are plotted in Figure 2 and corrected pairwise comparisons are listed in Table 3. Participants were more likely to report suicidal thoughts while engaging in NSSI compared to any ED behavior. Regarding indirect suicidal intentions, participants reported significantly greater knowledge of dying sooner due to restrictive eating than due to NSSI and binge eating, and a greater knowledge of dying sooner via compensatory behaviors than binge eating, but not NSSI. There were no significant differences in participants' reports of hoping to die via NSSI and restrictive eating, with greater levels reported for each of these behaviors compared to either binge eating or compensatory behaviors. Participants reported a greater confidence that restrictive eating could result in death than binge eating and compensatory behaviors, but not NSSI. Moreover, participants reported a greater confidence of dying sooner due to compensatory behaviors than binge eating, with no significant differences between binge eating and NSSI nor compensatory behaviors and NSSI. Finally, regarding thinking of in these behaviors to kill oneself, participants reported higher levels for both

TABLE 1 Results of one-sample *t*-test and descriptive statistics for primary study outcomes

	M	*SD*	*n*	Mean difference	95% CI	*t*	df
To hurt body moment							
Restrict	1.38	1.89	145	1.38	1.07, 1.69	8.79***	144
Binge	1.44	2.11	131	1.45	1.07, 1.80	7.80***	130
Compensatory behaviors	1.75	2.17	113	1.75	1.35, 2.16	8.57***	112
NSSI	4.29	2.09	136	4.29	3.94, 4.65	23.99***	135
Knowing hurt body moment							
Restrict	1.74	2.12	145	1.74	1.39, 2.08	9.94***	144
Binge	2.05	2.35	131	2.05	1.60, 2.45	9.98***	130
Compensatory behaviors	2.58	2.40	113	2.58	2.14, 3.03	11.43***	112
NSSI	4.11	2.27	136	4.11	3.73, 4.50	21.12***	135
To hurt body long run							
Restrict	1.95	2.38	145	1.95	1.56, 2.34	9.86***	144
Binge	0.56	1.19	131	0.56	0.35, 0.76	5.36***	130
Compensatory behaviors	0.82	1.65	113	0.82	0.52, 1.13	5.31***	112
NSSI	1.18	1.97	136	1.18	0.84, 1.51	6.97***	135
Knowing hurt body long run							
Restrict	2.97	2.38	145	2.97	2.57, 3.36	14.99***	144
Binge	2.08	2.15	131	2.08	1.70, 2.45	11.05***	130
Compensatory behaviors	2.81	2.24	113	2.81	2.40, 3.23	13.34***	112
NSSI	2.21	2.25	136	2.21	1.82, 2.59	11.43***	135
Think about suicide							
Restrict	1.72	1.90	145	1.72	1.41, 2.04	10.94***	144
Binge	1.94	2.29	131	1.94	1.54, 2.33	9.69***	130
Compensatory behaviors	1.76	2.08	113	1.76	1.37, 2.15	8.98***	112
NSSI	3.07	2.27	136	3.07	2.68, 3.45	15.77***	135
Hope to die sooner							
Restrict	1.74	2.21	145	1.75	1.38, 2.11	9.49***	144
Binge	0.45	1.23	131	0.45	0.24, 0.66	4.19***	130
Compensatory behaviors	0.88	1.65	113	0.88	0.57, 1.18	5.63***	112
NSSI	1.29	1.98	136	1.29	0.95, 1.62	7.58***	135
Knowledge die sooner							
Restrict	2.19	2.23	145	2.19	1.82, 2.55	11.81***	144
Binge	1.05	1.84	131	1.05	0.73, 1.36	6.49***	130
Compensatory behaviors	1.82	2.14	113	1.82	1.43, 2.22	9.08***	112
NSSI	1.28	1.96	136	1.28	0.95, 1.61	7.62***	135
Confidence could kill self							
Restrict	2.01	2.11	145	2.01	1.66, 2.35	11.47***	144
Binge	0.99	1.78	131	0.99	0.68, 1.30	6.37***	130
Compensatory behaviors	2.1	2.22	113	2.10	1.68, 2.51	10.03***	112
NSSI	1.86	2.25	136	1.86	1.48, 2.24	9.65***	135
To kill self							
Restrict	1.14	1.76	145	1.15	0.86, 1.43	7.82***	144
Binge	0.26	0.80	131	0.26	0.12, 0.40	3.71***	130
Compensatory behaviors	0.58	1.43	113	0.58	0.32, 0.85	4.34***	112
NSSI	1.69	2.20	136	1.69	1.32, 2.06	8.97***	135

Note. NSSI = Nonsuicidal Self-injury; *M* = Mean; *SD* = Standard Deviation; 95% CI = 95% Confidence Interval for Mean Difference.
***$P < .001$.

restrictive eating and NSSI than for binge eating and compensatory behaviors. No significant differences were observed between binge eating or compensatory behaviors, nor between NSSI and restrictive eating.

6 | DISCUSSION

Current conceptualizations regard ED behaviors as indirect self-harm and NSSI as direct self-harm, with both sets of behaviors classified as

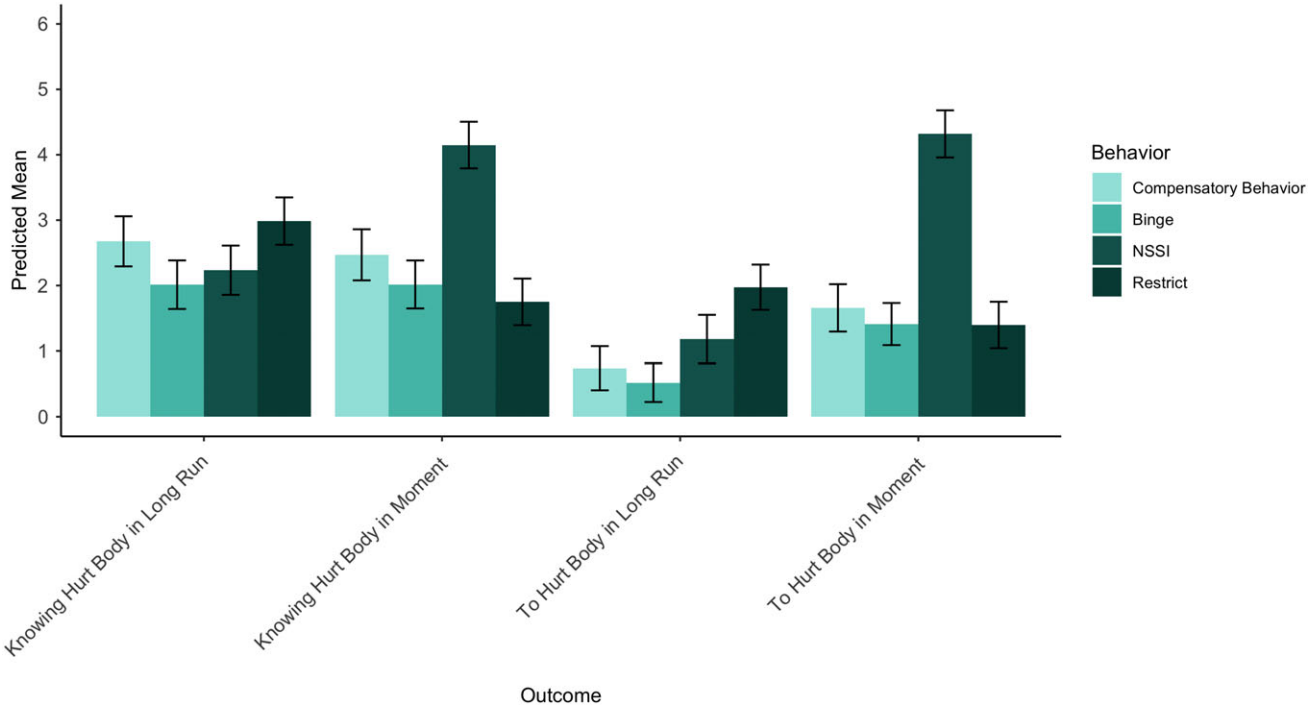

FIGURE 1 Least square mean responses and confidence intervals to self-harming intent and knowledge across NSSI and ED behaviors [Color figure can be viewed at wileyonlinelibrary.com]

TABLE 2 Results of linear mixed effects model of the relationship between type of self-harming behavior and self-reported self-harming intentions and knowledge

Contrast	Estimate	SE	df	*t* ratio	*P* value
To hurt body in the moment					
Binge—NSSI	−2.91	0.23	360.78	−12.41	<.0001
Binge—compensatory behaviors	−0.25	0.21	571.01	−1.20	1.00
Binge—restrict	0.01	0.21	486.45	0.07	1.00
NSSI—compensatory behaviors	2.66	0.24	366.73	11.32	<.0001
NSSI—restrict	2.92	0.23	344.46	12.47	<.0001
Compensatory behaviors—restrict	0.26	0.20	541.70	1.30	1.00
Knowing hurt body in the moment					
Binge—NSSI	−2.13	0.24	364.27	−9.06	<.0001
Binge—compensatory behaviors	−0.45	0.21	566.13	−2.19	.29
Binge—restrict	0.27	0.21	487.57	1.28	1.00
NSSI—compensatory behaviors	1.68	0.24	369.88	7.11	<.0001
NSSI—restrict	2.40	0.23	345.05	10.25	<.0001
Compensatory behaviors—restrict	0.72	0.20	551.22	3.54	.01
To hurt body in the long run					
Binge—NSSI	−0.66	0.23	360.61	−2.83	.05
Binge—compensatory behaviors	−0.22	0.20	574.21	−1.07	1.00
Binge—restrict	−1.45	0.21	489.27	−7.04	<.0001
NSSI—compensatory behaviors	0.44	0.23	367.31	1.89	.54
NSSI—restrict	−0.79	0.23	345.79	−3.38	.01
Compensatory behaviors—restrict	−1.24	0.20	557.33	−6.15	<.0001
Knowing hurt body in the long run					
Binge—NSSI	−0.22	0.24	366.11	−0.94	1.00
Binge—compensatory behaviors	−0.66	0.21	573.19	−3.21	.02
Binge—restrict	−0.97	0.21	491.60	−4.67	.00
NSSI—compensatory behaviors	−0.44	0.24	372.20	−1.87	.54
NSSI—restrict	−0.75	0.23	345.75	−3.20	.02
Compensatory behaviors—restrict	−0.31	0.20	559.55	−1.53	.89

Note. P value adjustment: holm method for 24 tests; NSSI = Non-suicidal Self-injury; SE = Standard Error; df = degrees of freedom.

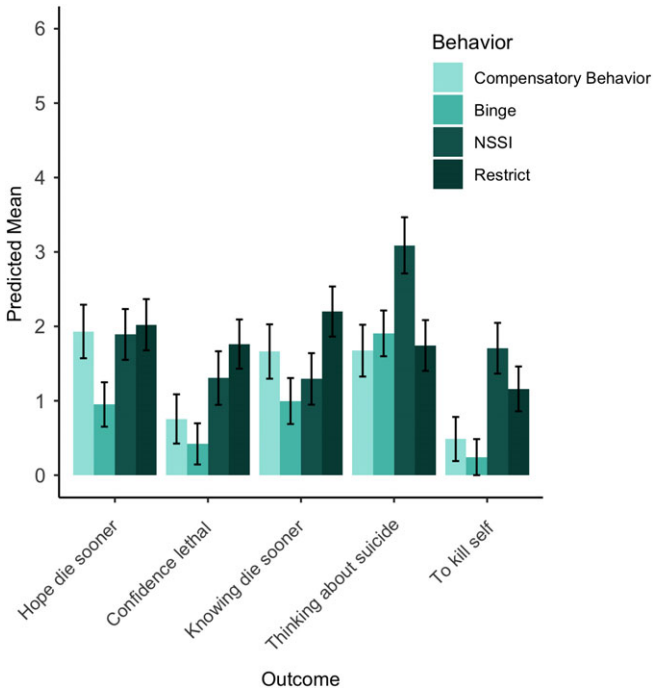

FIGURE 2 Least square mean responses and confidence intervals to suicide and death related cognitions and intentions across NSSI and ED behaviors [Color figure can be viewed at wileyonlinelibrary.com]

nonsuicidal (e.g., Favazza et al., 1989; Laye-Gindhu & Schonert-Reichl, 2005; St. Germain & Hooley, 2012; St. Germain & Hooley, 2013). Although useful, these classifications assume firm boundaries across direct and indirect, and suicidal and nonsuicidal self-harming categories. The present study used a data-driven approach to test assumptions underlying classification of self-harming behaviors with a particular focus on ED behaviors and NSSI. Results indicated that assumptions underlying these classifications may be inaccurate, likely hindering research and clinical work with people engaging in these behaviors.

Participants reported some intent to hurt themselves physically in the moment and in the long run via NSSI and via each ED behavior (i.e., restrictive eating, binge eating, compensatory behaviors). Although reports of intent to cause and knowledge of causing physical harm via ED behaviors were lower than for NSSI, results are inconsistent with definitions of indirect self-harm, which require that these behaviors are *not* enacted with the intent to cause physical harm in the short-term. Rather than considering direct and indirect self-harming behaviors as entirely unique and non-overlapping categories, it may be more accurate and meaningful to consider and measure self-harming intentions as lying on a continuum. Of note, we are not arguing that self-harming motivations are *primary* for ED behaviors. ED behaviors and NSSI may have other, distinct primary motivations. Instead, we argue that at least some people engaging in ED behaviors may be doing so to hurt themselves physically, in the short and long-term, and that these intentions should not be ignored. Asking about these intentions in clinical settings could shed light on novel treatment targets for ED behaviors. For example, interventions targeting factors associated with the desire to cause harm to oneself (e.g., self-punishment) might be helpful for some individuals engaging in ED behaviors. Moreover, results have important implications for research on ED behaviors. It may be enlightening to test how self-harming intentions evolve across repeated engagement in ED behaviors, and to test how such intentions are related to comorbidity between NSSI and ED behaviors.

Similarly, although NSSI and ED behaviors are considered nonsuicidal, several results emerged to question this concrete determination. On average, participants reported thoughts of suicide, indirect suicidal intent (i.e., hope and knowledge of a shorter life because of engagement in these behaviors), and even thoughts of engaging in these behaviors to kill oneself via each of these behaviors. In other words, people may engage in NSSI and ED behaviors *knowing* that these behaviors could be lethal in the long run, with some explicitly wanting to die sooner as a result of these behaviors. These results provide quantitative support for previous qualitative findings that some individuals with EDs report a desire for their behaviors to lead to death (Nordbø et al., 2006). Although average responses to these suicide-relevant intentions were generally very low, results suggest that suicidal and nonsuicidal self-harming behaviors may not be entirely distinct and non-overlapping categories. Again, *we are not* arguing that distinctions across suicidal and nonsuicidal self-harming behaviors should be ignored or considered obsolete, nor are we arguing for use of terms like "deliberate self-harm" or "self-harm" to describe all self-harming behaviors regardless of intent (e.g., Kapur, Cooper, O'connor, & Hawton, 2013). Instead, we believe that assumptions of entirely firm and distinct boundaries across suicidal and nonsuicidal self-injury may be overly simplistic. Dimensional assessment of direct and indirect suicidal intentions, both in clinical and research settings, may be more useful. In clinical settings, such dimensional assessment could help explain meaningful differences across individuals engaging in ED and NSSI behaviors and may set the stage for different treatment targets. In research settings, dimensional assessments of these intentions may shed light on unique trajectories of NSSI, ED behaviors, and suicidal thoughts and behaviors across time. This view is consistent with evidence that considering wish to live and wish to die continuously, on a spectrum, can help ascertain risk of future suicidal behaviors (Brown et al., 2005).

In addition to these general patterns, results highlighted important differences across specific behaviors studied. NSSI was associated with higher intent to and knowledge of causing physical harm in the moment. It was also associated with higher levels of suicidal thoughts, indicating that NSSI may be more directly harmful and more closely linked with suicidal thoughts than are ED behaviors. Key differences across ED behaviors also emerged. Restrictive eating was associated with higher intent to cause longer-term physical harm, with higher hope and knowledge of dying sooner as a consequence of these behaviors, and with higher thoughts of engaging in these behaviors to kill oneself than either binge eating or compensatory behaviors. These findings are consistent with research suggesting that, compared to binge eating and compensatory behaviors, restrictive eating is more strongly linked with nonsuicidal self-harming behaviors (Wang et al., 2018; but see Claes & Muehlenkamp, 2014 for an exception). Moreover, results indicated that restrictive eating may be more closely related to suicidal behaviors than other ED behaviors. This is particularly concerning because restrictive eating is common among people

TABLE 3 Results of linear mixed effects model of the relationship between type of self-harming behavior and suicide and death related thoughts, hopes, confidence, intentions, and knowledge

Contrast	Estimate	SE	df	*t* ratio	*P* value
Think about suicide					
Binge—NSSI	−1.18	0.20	461.98	−5.98	<.0001
Binge—compensatory behaviors	0.23	0.19	573.54	1.23	1
Binge—restrict	0.16	0.19	478.00	0.85	1
NSSI—compensatory behaviors	1.42	0.21	425.95	6.77	<.0001
NSSI—restrict	1.35	0.19	434.48	6.93	<.0001
Compensatory behaviors—restrict	−0.07	0.19	533.02	−0.37	1
Hope to die sooner					
Binge—NSSI	−0.88	0.20	456.41	−4.49	<.0001
Binge—compensatory behaviors	−0.34	0.19	567.95	−1.79	.75
Binge—restrict	−1.34	0.19	473.78	−7.00	<.0001
NSSI—compensatory behaviors	0.55	0.21	421.35	2.64	.10
NSSI—restrict	−0.46	0.19	431.33	−2.35	.21
Compensatory behaviors—restrict	−1.01	0.19	522.84	−5.40	<.0001
Knowledge die sooner					
Binge—NSSI	−0.30	0.20	461.69	−1.51	1
Binge—compensatory behaviors	−0.67	0.19	569.78	−3.52	.01
Binge— restrict	−1.20	0.19	476.86	−6.26	<.0001
NSSI—compensatory behaviors	−0.37	0.21	425.73	−1.76	.75
NSSI—restrict	−0.91	0.19	433.88	−4.67	.0001
Compensatory behaviors—restrict	−0.54	0.19	525.33	−2.86	.06
To kill self					
Binge—NSSI	−1.46	0.20	447.22	−7.46	<.0001
Binge—compensatory behaviors	−0.24	0.19	562.42	−1.31	1
Binge—restrict	−0.92	0.19	468.46	−4.81	<0001
NSSI—ompensatory behaviors	1.22	0.21	411.15	5.92	<.0001
NSSI—restrict	0.55	0.19	428.33	2.82	.07
Compensatory behaviors—restrict	−0.67	0.18	515.75	−3.65	<.0001
Confidence could kill self					
Binge—NSSI	−1.46	0.20	447.22	−7.46	<.0001
Binge—compensatory behaviors	−0.24	0.19	562.42	−1.31	1
Binge—restrict	−0.92	0.19	468.46	−4.81	<.0001
NSSI—compensatory behaviors	1.22	0.21	411.15	5.92	<.0001
NSSI—restrict	0.55	0.19	428.33	2.82	.07
Compensatory behaviors—restrict	−0.67	0.18	515.75	−3.65	<.0001

Note. P value adjustment: holm method for 24 tests; NSSI = Non-suicidal Self-injury; SE = Standard Error; df = degrees of freedom.

with EDs (Elran-Barak et al., 2015) and among people in non-clinical samples (Haynos et al., 2018; Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011). Indeed, in our sample, more subjects endorsed restrictive eating than any other ED behaviors. Results highlight the severity of this relatively commonplace behavior, including that, in some cases, restrictive eating may be driven by an intent to self-harm in ways both lethal and non-lethal, particularly in the long-term. Findings are particularly important in light of evidence that therapists often do not ask about self-injurious thoughts and behaviors among patients with eating disorders, and particularly among patients who engage in only restrictive eating (without binge eating/purging; Peebles et al., 2011).

Results should be considered alongside several important limitations. First, the present sample included primarily Caucasian females with a history of both ED behaviors and NSSI. It is unclear whether results would generalize to other racial or ethnic groups, to males, or to those with only a history of either ED behaviors or NSSI. Second, data were collected online, and all ED and NSSI behaviors were assessed via self-report. Several steps were taken to ensure valid participant responding; however, attention checks and time until completion were not used to validate survey responses. Although a large and growing body of research indicates that online, self-report methods can be used to obtain accurate clinical information (e.g., Bauermeister et al., 2012; Crump et al., 2013; Hauser and Schwartz, 2016;

Weinberg et al., 2014), it is unclear whether interview-based assessments of these behaviors would align with self-report or whether participants maintained full attention throughout the survey. Third, comparisons between NSSI and ED behaviors were based primarily on novel questions assessing the extent to which people engage in these behaviors, on *average*, for the reasons cited above. Future studies are needed to assess the psychometric properties of these items, including the test–retest reliability of these novel items and their associations with related items. Moreover, future work is needed to test the extent to which participants report different motivations across specific episodes of these behaviors, perhaps via ecological momentary assessment. This approach could shed light on whether and for whom the intentions of these behaviors change over time, and whether certain patterns are more or less associated with suicidal thoughts and behaviors across time. Fourth, differences across behaviors were tested using Holm corrections. This type of correction may be overly conservative and may have obscured differences across behaviors that could have been detected using a less conservative approach. Future studies should continue to examine these relationships to see whether observed results are stable. Fifth, the present study combined a variety of behaviors (i.e., purging, excessive exercise, laxative use) into the category of compensatory behaviors in light of evidence that there are few differences in symptom profiles across individuals engaging in these different behaviors (Mond, Hay, Rodgers, Owen, & Mitchell, 2009). However, it is possible that self-harming and suicidal intentions vary across these different compensatory behaviors. Future research assessing this possibility is needed. Finally, the present study considered only one category of indirect self-harm: ED behaviors. Although results suggest that some aspects of ED behaviors violate definitions of indirect self-harm, the degree to which other indirectly harmful behaviors (e.g., excessive substance use, risky relationships) violate these assumptions should be explored in future studies.

Despite these limitations, the present investigation highlights that traditionally defined categories of direct and indirect self-harm may overlap more than previously assumed. ED behaviors may be enacted with at least *some* intent to cause short-term physical harm. Moreover, across NSSI and ED behaviors, people may engage in these behaviors with the knowledge, hope, and even intent to die in the short- or long-term from these behaviors. Dimensional examination of self-harming and suicidal intentions across behaviors and over time could shed important light on comorbidity among NSSI, ED behaviors, and suicidal behaviors, and may provide insight into shared intervention targets.

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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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