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Post-therapy functional impairment as a treatment outcome measure in non-suicidal self-injury disorder using archival data

ANNE WARD[1], THEODORE W. BENDER[2], KATHRYN H. GORDON[3], MATTHEW K. NOCK[4], THOMAS E. JOINER[5] AND EDWARD A. SELBY[6], [1]Martin Research and Consulting, LLC, USA; [2]Brown University, Providence, RI, USA; [3]North Dakota State University, Fargo, ND, USA; [4]Harvard University, Cambridge, MA, USA; [5]Florida State University, Piscataway, NJ, USA; [6]Rutgers University, Piscataway, NJ, USA

ABSTRACT

There have been calls for the creation of a non-suicidal self-injury (NSSI) disorder, and a recent DSM-5 work group has delineated potential diagnostic criteria for the proposed disorder. Preliminary research comparing NSSI disorder to Axis I disorders and its closest diagnostic 'neighbor', borderline personality disorder (BPD), suggests that impairment at intake, patient history of associated features and diagnostic co-occurrence rates set NSSI disorder apart from existing DSM-IV-TR disorders. However, few studies have examined the treatment course of NSSI disorder relative to other disorders. The purpose of this study was to distinguish potential treatment outcome differences between a potential NSSI disorder, BPD and Axis I. Archival data (N = 571), which included ratings of functioning at therapy intake and termination, were analysed to determine between-group differences. Although no significant differences in the number of months in therapy or number of sessions attended were found, findings suggest that the NSSI group made strong gains in therapy, as evidenced by improvements in clinician ratings of functional impairment from intake to termination. These findings suggest that NSSI disorder may have a positive prognosis with treatment.

Non-suicidal self-injury (NSSI) refers to deliberately inflicting damage and/or pain to one's bodily tissue without suicidal intent (Nock & Favazza, 2009). Research exploring the psychopathological function of NSSI suggests that the behaviour has both positive (e.g. attention from others, anti-dissociation and seeing blood) and negative reinforcing properties (i.e. relieving negative affect), which may further motivate the behaviour (Glenn & Klonsky, 2010; Gordon et al., 2010; Selby, Bender, Gordon, Nock, & Joiner, 2009). Although NSSI is a diagnostic criterion of borderline personality disorder (BPD), it is also commonly found outside of a BPD diagnosis, as approximately 4% of adults in the United States engage in NSSI and prevalence rates of BPD have been estimated at only 2% (American Psychiatric Association, 1994; Briere & Gil, 1998). Research suggests that NSSI is even more common in adolescent populations (Nock, Joiner, Gordon, Lloyd-Richardson, &

Prinstein, 2006). Given the prevalence of NSSI and evidence that these behaviours occur in individuals with a variety of Axis I diagnoses who do not meet criteria for BPD, it is possible that a portion of individuals who engage in NSSI may belong to a distinct diagnostic category not captured by *DSM-IV-TR* (Selby, Bender, & Joiner, 2012).

Over the past three decades, the clinical potential for a diagnostic category describing NSSI disorder has been expressed (Favazza & Rosenthal, 1990; Muehlenkamp, 2005; Pattison & Kahan, 1983). Recently, one *DSM-5* work group published a proposal suggesting the following criteria for establishing NSSI disorder and NSSI disorder not-otherwise-specified (NOS) in the upcoming DSM-5 as an Axis I disorder (Shaffer & Jacobson, 2009): the presence of five or more instances of NSSI over the past year and the presence of two of the following motivations: stress reduction, difficulty resisting NSSI impulses, frequent urges to engage in NSSI and/or the behaviour is engaged in for emotional/cognitive or social functions. If criteria are not fully met, the individual should be diagnosed as having NSSI disorder NOS. Importantly, other disorders should not better account for the NSSI behaviour (e.g. a developmental disorder and BPD).

Given the serious health risks that NSSI poses, including increased risk for permanent tissue damage and elevated rates of suicidal behaviour (Nock et al., 2006), decreasing self-injurious behaviour is of utmost importance to clinicians. Establishment of an NSSI disorder may spur further research and development of empirically based therapies designed to reduce self-injurious behaviour. Creation of the disorder may also be clinically useful in identifying the severity of NSSI behaviour because therapy targeted at Axis I psychopathology may fail to fully assess the frequency of and motivations for NSSI in the absence of a BPD diagnosis. Furthermore, individuals who self-injure are often diagnosed with personality disorder not-otherwise-specified (PDNOS) because they fall short of full diagnostic criteria for BPD. Addition of a NSSI disorder would likely improve patient care by providing a more descriptive diagnosis and tailored treatment course for patients who engage in NSSI but currently carry the diagnosis of PDNOS, especially when other personality features are not present.

Recent research using archival data to explore a potential NSSI disorder has found some differences in functionality at intake, Axis I prevalence rates and associated features of those with NSSI disorder compared with Axis I and BPD comparison groups (Selby et al., 2012). Prevalence of past and/or current depressive disorder, dysthymia, bipolar disorder, anxiety disorder, substance abuse disorder, substance dependence disorder, eating disorder, ADHD, stereotypic movement disorder, trichotillomania and other impulse control disorders was reported. Findings suggest that those with NSSI disorder, relative to other Axis I disorders, have greater functional impairment at intake, more mood swings, increased aggression, increased strange beliefs/thoughts and elevated psychopathology including depression, anxiety and suicidality (Selby et al., 2012). This study also found that, in comparison with the NSSI group, the BPD group included fewer men and reported greater experiences of past abuse.

Several treatment modalities have demonstrated reductions in self-injury in general. For example, dialectical behaviour therapy, mentalization-based therapy, transference-focused psychotherapy, manual-assisted cognitive–behavioural therapy and standard cognitive–behavioural treatment have received considerable empirical attention for the treatment of NSSI, while psychodynamic therapies and cognitive–analytic therapy have also shown some potential for decreasing these behaviours (Klonsky & Muehlenkamp, 2007). Other studies have shown that problem-solving therapies may be a pragmatic approach for treating patients who self-injure. Interesting, one meta-analysis, which found that antidepressants were no more effective than a placebo in treating self-injury, concluded that problem-solving therapy was the most promising treatment for reducing self-injury

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(Hawton et al., 1998). Another meta-analysis found that depression, hopelessness and problems improved most in response to problem-solving therapy when compared with five other treatments (Townsend et al., 2001). Evidence supporting pharmacological treatment of NSSI in adults who are not developmentally delayed is limited. However, the existing literature does show preliminary evidence that opiate antagonists, antipsychotics and anticonvulsants may be effective in reducing frequency of NSSI behaviours in patients with a variety of comorbid disorders (Cassano et al., 2001; Chengappa, Ebeling, Kang, Levine, & Parepally, 1999; Griengl, Sendera, & Dantendorfer, 2001).

The purpose of this paper was to provide a preliminary evaluation of the treatment response of a potential NSSI disorder. To do so, we compared archival data on treatment responses between a potential NSSI disorder, BPD and other Axis I disorders by discussing treatment outcome data collected during the aforementioned study (Selby et al., 2012). Archival data ($N = 571$) from an outpatient clinic were obtained on functional impairment at therapy intake and therapy termination. These measures, and other treatment relevant data, were analysed to explore between-group differences at treatment termination. Patients were assigned to one of three groups: NSSI without BPD, BPD (with and without NSSI) or a comparison group composed of individuals with Axis I disorders who fell short of both BPD and the proposed NSSI disorder diagnostic criteria. Functional impairment was rated after the intake session and at therapy termination, and treatment outcomes for each group were determined by number of months in treatment, number of therapy sessions attended and whether therapy was terminated prematurely. We hypothesized that the NSSI group would have a worse prognostic outcome, as measured by the Global Assessment of Functioning (GAF) and Clinical Global Impressions (CGI), than the Axis I comparison group and a similar prognosis as that of the BPD group following therapy.

Method

Participants

Participants consisted of adult outpatients ($N = 571$, 53% female, 47% male) who sought treatment at a university-based general psychology clinic between January 2001 and December 2007. Patients served by the clinic are primarily from the community, and only a small portion were students at the university. Data collection and the analyses for this study were approved by the Florida State University institutional review board, and all participants understood and consented to the research as well as the clinic's training environment upon their intake.

Demographic information and diagnostic co-occurrence rates are detailed in Table 1. Although some of the following information on treatment group breakdown is reported in Selby et al. (2012), we reiterate the findings here because of their relevance to the novel treatment outcome data provided in this study. Regarding group composition, 65 patients met inclusion criteria for the NSSI disorder group, 24 patients met diagnostic criteria for BPD (approximately 54% reported NSSI) and the clinical comparison group consisted of all other adult patients in the clinic's database who were diagnosed with an Axis I disorder but did not meet BPD criteria or endorse self-injury ($N = 482$). Both the NSSI and BPD groups had significantly higher rates of depressive disorder than the comparison group. All but one patient in the NSSI group had at least one Axis I diagnosis, and there were no group differences in total number of Axis I diagnoses among patient groups. Results revealed that the NSSI group had a significantly higher rate of mood disorders (i.e. depression, dysthymia and bipolar disorders) and of Cluster A personality disorders than the comparison group. Those with BPD were higher than those in the comparison condition on depression only. There were no significant differences in comorbidity between those with NSSI and BPD. Only one patient in the NSSI group was diagnosed with PDNOS, indicating that most endorsed less than four symptoms of BPD.

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Table 1: Demographics and diagnostic co-occurrence rates

	NSSI (*N* = 65)	BPD (*N* = 24)	Comparison (*N* = 482)	F(2, 550)	*d*
Age (M/SD)	26.3 (9.2)	24.8 (8.3)	27.6 (9.6)	1.4	–
	N (%)	*N* (%)	*N* (%)	Wald	OR
Female	33 (51)^{b1}	21 (88)^{a}	252 (52)^{b2}	8.8**^{b1}, 8.3**^{b2}	6.7^{b1}, 6.4^{b2}
Some college	37 (57)	19 (79)	273 (57)	*ns*	–
Never married	53 (82)	18 (75)	347 (72)	*ns*	–
Caucasian	47 (72)	19 (83)	366 (76)	*ns*	–
Hispanic	7 (11)	1 (5)	43 (9)	*ns*	–
African American	5 (8)	2 (9)	33 (7)	*ns*	–
Asian	3 (5)	1 (5)	16 (3)	*ns*	–
Native American	0 (0)	0 (0)	9 (2)	*ns*	–
Adjustment disorder	1 (2)	1 (4)	18 (4)	*ns*	–
ADHD	0 (0)	0 (0)	21 (4)	*ns*	–
Depressive disorder	27 (42)^{a1}	11 (46)^{a2}	119 (25)^{b}	8.0**^{a1}, 5.0*^{a2}	2.2^{a1}, 2.6^{a2}
Dysthymia	16 (25)^{a}	3 (13)	49 (10)^{b}	10.6**	2.9
Anxiety disorder	11 (17)	4 (17)	103 (21)	*ns*	–
Bipolar disorder	6 (11)^{a}	1 (4)	11 (2)^{b}	7.8**	4.4
Substance abuse	0 (0)	2 (8)	22 (5)	*ns*	–
Substance dependence	2 (3)	2 (8)	17 (4)	*ns*	–
Eating disorder	1 (0)	2 (8)	13 (3)	*ns*	–
Cluster A	4 (6)^{a}	0 (0)	1 (0.1)^{b}	9.4**	31.5
Cluster B^	2 (3)	0 (0)	14 (3)	*ns*	–
Cluster C	4 (1)	1 (4)	17 (4)	*ns*	–
PDNOS	0 (0)	0 (0)	22 (5)	*ns*	–
Trichotillomania	0 (0)	0 (0)	5 (1)	*ns*	–
Other impulse disorders	0 (0)	0 (0)	3 (0.6)	*ns*	–
Stereotypic movement disorder	0 (0)	0 (0)	5 (1)	*ns*	–

Note: ^ indicates that Cluster B diagnoses do not include BPD; $**p < 0.01$; $*p < 0.05$; *ns*, not significant. Values with different superscripts are significantly different from each other (a > b > c). NSSI, non-suicidal self-injury; PDNOS, personality disorder not-otherwise-specified. Some college refers to have had at least 1 year of college education. Table reprinted from Selby et al. (2012).

Non-suicidal self-injury group

In regard to the NSSI group, 2% had adjustment disorder, 42% were diagnosed with depressive disorder, 25% met criteria for dysthymia, 17% had anxiety disorder, 11% were diagnosed with bipolar disorder and 3% experienced substance dependence. No participants in this group demonstrated an eating disorder, ADHD or substance abuse.

Borderline personality disorder group

Concerning the BPD group, 4% of participants were diagnosed with adjustment disorder, 46% had depressive disorder, 13% met criteria for dysthymia, 17% were diagnosed with anxiety disorder and 4% had bipolar disorder. Substance abuse, substance dependence and eating disorder each had prevalence rates of 8%, and no one in this group had ADHD.

Axis I comparison group

Regarding the Axis I comparison group, a quarter of participants met diagnostic criteria for depressive disorder, 10% had dysthymia, 21% were diagnosed with anxiety disorder, 2% met criteria for bipolar disorder and 5% demonstrated substance abuse. Substance dependence, adjustment disorder and

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ADHD were each prevalent in 4% of the Axis I group, and 3% of this group had an eating disorder.

Clinical assessment

Upon starting therapy at the clinic, patients were assigned to a therapist responsible for administering a psychological history, conducting clinical interviews for Axis I and II diagnoses, determining diagnoses and conducting treatment sessions. Each patient's assessment and therapy were conducted by separate graduate students working towards a PhD in clinical psychology. Before working in the clinic, each student completed at least a year of clinical coursework and received supervision 2–3 h weekly from a licensed clinical psychologist responsible for providing input on the assigned diagnoses and treatment approach. All assessors/therapists passed exams on the use of structured clinical interviews for Axis I and II disorders as well as therapy and clinic policies, procedures and ethics prior to administering treatment. Thus, all therapists were supervised and well-trained in assessing patients and conducting therapy.

Measures

Assessment at intake

Non-suicidal self-injury disorder inclusion criteria. The following criteria determined placement in the NSSI disorder group: (1) report of self-inflicted pain and/or injury over the previous year as determined by responding yes to 'have you experienced problems with self-inflicted injury or pain, not counting suicide attempts?'; (2) the patient did not meet diagnostic criteria for BPD (those with BPD who self-injured were included in the BPD group); and (3) self-injury was not better accounted for by a diagnosis of mental retardation or autism spectrum disorder. Although data concerning frequency of and motivations for NSSI were not collected from this sample, all participants reported at least one instance of self-injury without suicidal intent in the past year. It is important to note that the criteria used for diagnosing NSSI disorder in this study differ from that of the DSM-5 proposal, because we were unable to determine frequency of NSSI over the last year and establish motivation for NSSI behaviour with these archival data. Yet, while considering this limitation, it is also important to note that the proposed criteria for DSM-5 NSSI disorder are themselves preliminary, and the goal of this study was not to validate them. Rather, our goal was to examine treatment outcome differences of those with a potential NSSI disorder that do not have simultaneous diagnoses of BPD, PDNOS or a pervasive developmental disorder from Axis I comparison and BPD groups — something that few studies have done.

Assessment of Axis I diagnoses. Participants seen before 2005 were administered the *Mini International Neuropsychiatric Interview* (Sheehan, Lecrubier, & Sheehan, 1998), and those entering the clinic after September 2005 were administered the *Structured Clinical Interview for the DSM-IV Axis I* (First, Spitzer, Gibbon, & Williams, 1995). These clinical interviews have been found to have similar diagnostic prevalence rates (Jones et al., 2005).

Assessment of Axis II diagnoses. All participants were administered the BPD portion of the *Structured Clinical Interview for DSM-IV Axis II personality disorders* (First, Spitzer, Gibbon, & Williams, 1997).

Global assessment of functioning (APA, 1994). Global functioning and symptom severity across educational, interpersonal and occupational settings was rated by the clinician at therapy intake and termination. GAF ratings gauge overall patient function and symptom intensity, and scores have been reliably associated with clinical diagnosis, psychiatric symptoms and various clinical outcome ratings (Friis, Melle, Opjordsmoen, & Retterstol, 1993; Moos, McCoy, & Moos, 2000).

Clinical global impressions (Guy, 1976). The CGI was rated by the therapist at treatment intake and termination. Severity of the patient's illness was rated on a 7-point Likert scale ranging from 1

DOI: 10.1002/pmh

(normal) to 7 (among the most extremely ill). This measure has demonstrated reasonable inter-rater agreement in this clinic ($\kappa = 0.84$; Lyons-Reardon, Cukrowicz, Reeves, & Joiner, 2002).

Number of previous treatments. All patients were asked how many times they had been in therapy, seen a mental health professional or sought medication for their psychological symptoms.

Suicide risk assessment. At the initiation of treatment, patients underwent a thorough suicide risk assessment by their assessing clinician, which followed the protocol recommended by Joiner, Walker, Rudd, and Jobes (1999). This assessment consisted of rating people in incremental levels of potential suicide risk by taking into account past suicidal behaviour and current suicidal ideation. People were rated using the following metric: Low Risk — indicating no current ideation, past attempt with no other risk factors or non-attempter with mild ideation symptoms; Moderate Risk — presence of suicidal ideation with some presence of plans or preparation, a multiple attempter with another key risk factor, or a non-attempter with severe suicidal ideation/desire and at least two other suicide risk factors; and High Risk — indicating a multiple attempter with two noted risk factors, non-attempter with severe symptoms of resolved plans and preparation, or a multiple attempter with resolved plans and preparation. Low Risk was coded (1), Moderate Risk was coded (2) and High Risk was coded (3). This clinic risk assessment was found to have good inter-rater reliability ($\kappa = 0.71$, $p < 0.001$) and convergent correlations with the BSS ($r = 0.64$, $p < 0.001$); for more details on this assessment, please see Van Orden, Witte, Gordon, Bender, and Joiner (2008).

Measures obtained at therapy termination

Outcome variables

Information on the number of months spent in therapy, number of sessions attended and premature termination was collected. Termination was deemed premature in circumstances where the patient quit attending therapy before completing treatment and against the recommendation of their therapist. Therapy termination was considered appropriate in situations where therapy was complete, the therapist initiated termination or an obvious external reason could account for the termination (e.g. moving).

Data analytic strategy

Chi-square analyses were used to examine premature termination. Multivariate analyses of variance (MANOVAs) were used to compare scores of functional impairment determined at intake (i.e. CGI, GAF and previous number of treatments). A repeated measures MANCOVA analysis was used to assess changes in CGI and GAF from intake to termination, while controlling for number of months in therapy and number of treatment sessions.

Results

Types of treatment utilized

In order to examine the prognosis of the NSSI group, treatment utility and response of patients was explored. During treatment, 53 members of the NSSI group (82%) were treated with cognitive behaviour therapy, 4 (6%) were treated with interpersonal psychotherapy, 4 (6%) with motivational interviewing and 4 (6%) with cognitive processing therapy. There were no significant differences in type of therapy administered across groups, $\chi^2(10) = 11.9$, $p = ns$, and the majority of individuals in each group received cognitive behavioural therapy of some type.

Clinical impairment at intake

Although information on clinical impairment at treatment intake is reported in Selby et al. (2012), this information is important to reiterate in the context of treatment outcomes. Upon intake, both the NSSI and BPD groups demonstrated higher CGI scores, lower GAF scores and more previous treatments than the comparison group. Those with NSSI disorder were also rated as having higher

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suicide risk than the controls (NSSI disorder M = 1.59, SD = 0.64; comparison M = 1.11, SD = 0.34; $F(1, 407) = 95.91$, $p < 0.001$) but not significantly different than the BPD group (BPD M = 1.72, SD = 0.70; $F(1, 62) = .436$, $p > 0.05$). In order to determine if these findings were primarily due to past suicide attempt history and/or mood disorder (as 42% of those with NSSI disorder also had a comorbid depressive disorder), the analyses were re-analysed with a dichotomous suicide attempt history variable (yes/no) included in the model. In these analyses, those with NSSI disorder still experienced elevated suicide risk ($F(1, 424) = 36.62$, $p < 0.001$), and NSSI disorder interacted with affirmative suicide attempt history ($F(1, 424) = 10.24$, $p < 0.01$) to predict even higher risk. NSSI disorder still exhibited higher CGI scores ($F(1, 546) = 25.82$, $p < 0.001$) and lower GAF ($F(1, 546) = 44.07$, $p < 0.001$) than the comparison group (but not the BPD group) when accounting for suicide attempt history, but it did not interact with history to predict worse outcomes on these variables.

Utilization of treatment

Groups were compared on number of months in therapy and number of therapy sessions in order to assess group differences in utilization of treatment. No significant differences in number of months in therapy ($F(2, 567) = 1.8$, *ns*) or number of therapy sessions ($F(2, 567) = 1.4$, *ns*) were found. All participants completed at least the intake session, and both the NSSI and BPD groups were rated as ending therapy prematurely more commonly than the Axis I group ($\chi^2(2) = 6.4$, $p < 0.05$). These results are displayed in Table 2. As can be seen in this table, 38 of those diagnosed with potential NSSI disorder (64%) were rated as terminating therapy early. For those with NSSI disorder who terminated treatment prematurely, the average number of therapy sessions was 10.61 (SD = 11.71), which was relatively, yet not significantly ($F(1, 494) = 0.182$, $p > 0.05$), fewer than those who terminated appropriately (15.19, SD = 16.61). Those with NSSI disorder who terminated therapy early generally spent fewer months in therapy (M = 5.38, SD = 4.91) than those who did not (M = 7.00, SD = 4.94), but again this was not a significant trend.

Response to treatment

In order to judge improvement in overall functioning, clinician CGI and GAF ratings from therapy intake to termination were explored with

Table 2: Outcome measures at termination

	NSSI ($N = 59$)	Comparison ($N = 440$)	BPD ($N = 22$)	
Measure	*n* (%)	*n* (%)	*n* (%)	$\chi^2(2)$
Premature termination	38 (64)[a]	215 (49)	14 (64)[c]	6.4*
Measure	NSSI ($N = 64$) M (SD)	Control ($N = 482$) M (SD)	BPD ($N = 23$) M (SD)	F(df = 2, 567)
CGI	3.6 (1.5)	2.8 (1.4)[ac]	4.2 (1.7)	16.7**
GAF	63.8 (16.1)	70.0 (12.8)[ac]	60.5 (15.3)	10.7**
Months	6.1 (4.9)	4.9 (6.7)	5.4 (4.1)	1.8
Sessions	12.6 (13.5)	9.9 (9.8)	10.9 (16.9)	1.4

Note: *$p < 0.05$; **$p < 0.01$. Superscripts: a, significant difference between NSSI group and Axis I group $p < 0.05$; b, significant difference between NSSI and BPD group $p < 0.05$; c, significant difference between BPD and Axis I group $p < 0.05$. CGI, Clinical Global Impressions; GAF, Global Assessment of Functioning; NSSI, non-suicidal self-injury.

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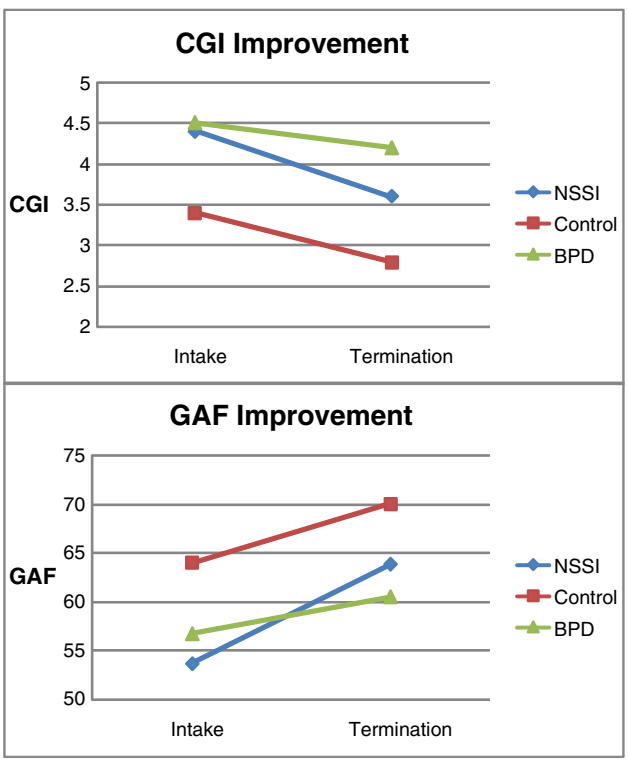
repeated measures MANCOVA. These results are displayed in Figure 1. Following therapy, the Axis I group displayed the highest level of functioning as measured by termination CGI ($F(2, 567) = 16.7$, $p < 0.01$) and termination GAF ($F(2, 567) = 10.7$, $p < 0.01$). The group × time interaction was significant for both the CGI ($F(2, 564) = 13.42$, $p < 0.01$) and the GAF ($F(2, 564) = 3.13$, $p < 0.05$). Number of prior treatments was also included as a covariate to control for any residual effects of previous therapy. Because high correlations between intake and termination measures of CGI ($r = 0.70$, $p < 0.01$) and GAF ($r = 0.70$, $p < 0.01$) were found, the analysis was corrected using the Greenhouse–Geisser ê statistic. There were no significant differences between the NSSI and BPD groups on termination CGI and GAF, although the NSSI group trended towards lower functional impairment (i.e. higher GAF and lower CGI scores).

To further examine other potential explanations for the identified interactions, we re-examined the analyses while including number of sessions completed while in therapy, the number of months in therapy and presence of a mood disorder at the start of therapy. We also coded for the presence of a previous suicide attempt across all participants and included this as a covariate to examine if suicidal behaviour was a specific factor in the NSSI disorder group's low initial functioning scores. This follow-up analysis indicated that although termination type (CGI: $F(1, 351) = 4.86$, $p < 0.05$), depressive disorder (CGI: $F(1, 351) = 9.95$, $p < 0.01$) and history of suicide attempts (GAF: $F(1, 351) = 6.02$, $p < 0.05$) interacted with time to



Note: Higher CGI scores indicate greater severity of illness, so decreases indicate improvement. Higher GAF scores indicate better functioning, so increases indicate improvement.

Figure 1: Post-therapy functional improvements by group.

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predict changes in functioning over therapy, number of sessions and months in therapy did not. Even with these covariates, the NSSI disorder group still interacted with changes in GAF and demonstrated more improvements following therapy than the comparison group ($F(1, 351) = 7.34$, $p < 0.01$) and the BPD group ($F(1, 351) = 4.56$, $p < 0.05$). Similar findings held for the NSSI disorder by change in CGI interaction compared with the comparison group ($F(1, 351) = 29.16$, $p < 0.001$), but not the BPD group ($F(1, 351) = 2.12$, $p > 0.05$)

Discussion

The results of this study suggest that the NSSI group had a worse prognostic outcome than the Axis I comparison group and a similar prognosis as the BPD group, following therapy. Although the Axis I group still had the lowest functional impairment at therapy termination, the NSSI group showed great improvement following treatment. This indicates that despite increased impairment at intake and a tendency to terminate therapy prematurely, the NSSI group may have a positive prognosis. These results generally held when controlling for presence of a mood disorder and suicide attempt history.

Although our findings provide initial support for differential treatment outcomes of BPD, the proposed NSSI disorder and other Axis I disorders, the results should be viewed in light of the study's limitations. One major constraint of the current effort was that these data were archival, which limited our ability to diagnosis NSSI disorder because data concerning motivations for and frequency of NSSI were not available. Although we could not match the criteria proposed by the DSM-5 work group for NSSI disorder with these data, it is important to consider that those criteria are themselves preliminary. Rather than confirming these proposed criteria, the current study contributes to the literature by comparing treatment outcomes of those with potential for a NSSI disorder diagnosis to Axis I and BPD comparison groups. Importantly, the findings of this study suggest that there may be differential treatment outcomes for those with a potential NSSI disorder relative to these other groups. Another limitation was that the assessment of NSSI used required those who self-injured to view the behaviour as problematic, when some who self-injure may not consider it a problem. To address these limitations, future studies should use a standardized clinical interview for NSSI, such as the Self-Injurious Thoughts and Behaviors Interview (Nock, Holmberg, Photos, & Michel, 2007).

Another issue with these data is that severity of impairment may have been understated in the NSSI group because patients were individuals receiving treatment at a general psychology clinic rather than an emergency room or psychiatric unit. Because individuals in the general population who engage in NSSI are often in danger of future suicide attempts or unintentional blood loss and death (Nock, 2006), future studies should examine NSSI disorder in inpatient treatments and emergency room settings.

Finally, the number of patients in the BPD group was relatively small, potentially decreasing the power needed to find significant differences between the NSSI and BPD groups. The BPD group also included individuals who reported self-injury, and this leaves to question the role of NSSI in the severity of impairment in those with BPD relative to those with BPD and without NSSI. Previous research suggests that individuals with BPD engage in NSSI anywhere from 26% (Chapman et al., 2005) to 50% to 80% (Oumaya et al., 2008). Few existing studies differentiate between those with BPD diagnoses with and without NSSI. Future research should continue to enquire about differences in motivation for self-injury in an effort to further differentiate between NSSI disorder and BPD. Because 54% of our BPD sample reported NSSI, our findings may have been suppressed if NSSI is actually less prevalent in a larger sample of individuals with BPD.

Considering the scope and constraints of the current study, additional research comparing treatment outcomes of individuals with NSSI

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disorder and BPD is necessary before group-specific prognoses can be validated. Future research should also continue to compare NSSI disorder and BPD to determine in what ways (e.g. motive, frequency, form, quality and decrease in NSSI behaviours specifically) self-injury may be different between the two groups. Additional research should seek to establish differential treatment outcomes between BPD and the proposed NSSI disorder, as well as determine other possible correlates of NSSI disorder, such as elevated pain tolerance or sensation seeking, and specific personality dimensions. Further investigations into the treatment of NSSI should also compare measures of psychopathology at intake and termination, as well as explore whether different therapy types are more efficacious in treating NSSI disorder and BPD.

Because it has been demonstrated that self-injury often remits during the transition from adolescence to adulthood, the creation of NSSI disorder may increase stigmatization of adolescents (Moran et al., 2011). Thus, diagnosis of adolescent patients with infrequent NSSI should be given with discretion to avoid unnecessary stigmatization. However, when self-injury is severe in adolescence or continues into adulthood, the clinical utility of a NSSI disorder diagnosis may outweigh the potential for stigmatization. Furthermore, the establishment of NSSI disorder may actually decrease stigma associated with misdiagnosis of a personality disorder that is not present, as clinicians view people who have these diagnoses as difficult to treat. Finally, possible differences in NSSI among adolescent and adult populations should be clarified, as this behaviour may be fundamentally different between the two groups and may warrant varied therapeutic approaches.

The results of the current study provide preliminary information on potential treatment outcome differences for a potential NSSI disorder. Therapies targeted specifically at reducing motivation for NSSI and other possible correlates may become increasingly necessary, especially if NSSI disorder is included in DSM-5. Although further research is needed to establish NSSI disorder as a diagnostic entity, and more closely controlled treatment outcome research is called for, we hope these encouraging results build a foundation for future investigations on treatment and prognosis of the proposed NSSI disorder.

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Address correspondence to: Edward A. Selby, Department of Psychology, Rutgers University, 53 Avenue E., Piscataway, NJ 08845, USA. Email: edward.selby@rutgers.edu

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