Negative Life Events and Non-Suicidal Self-Injury in an Adolescent Inpatient Sample

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Abstract

Objective—Although life stressors have been implicated in the aetiology of various forms of psychopathology related to non-suicidal self-injury (NSSI), particularly depression and suicidal behavior, they have rarely been examined in relation with NSSI. The objective of the current study was to assess the association between life stressors and NSSI in adolescent inpatients.

Methods—Adolescent inpatients (n = 110) completed measures of life events, NSSI, and depressive symptoms at three time-points over a nine-month period.

Results—Higher rates of life stressors were significantly associated with greater NSSI. This finding held even after covarying concurrent depressive symptoms and gender.

Conclusion—Life stressors may have a unique role in the pathogenesis of NSSI. Directions for future research and clinical implications are discussed.

Keywords

Life stressors; Non-suicidal self-injury; Adolescents

Introduction

Non-suicidal self-injury (NSSI), or the deliberate destruction of one's own bodily tissue in the absence of suicidal intent (Nock & Prinstein, 2004), has received increasing recognition in recent years as an important public health concern (Wilkinson & Goodyer, 2011). In addition to being a clinically significant phenomenon in its own right, NSSI is a strong predictor of suicidal behavior (Brent, 2011; Klonsky, May, & Glenn, in press). Adolescents appear to be a particularly high-risk group, with lifetime prevalence rates for NSSI ranging from 13% to 23.2% (Jacobson & Gould, 2007; Muehlenkamp, Claes, Havertape, & Plener, 2012). Moreover, among individuals with a history of NSSI, the median age of onset is 14

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years (Klonsky, 2011). Given the current absence of empirically supported prevention and treatment options for NSSI in adolescents (Nock, 2012), elucidating potential risk factors for this phenomenon may help identify promising targets for future intervention strategies. One such risk factor is negative life events.

According to stress exposure models of psychopathology, experiencing higher rates of life stressors increases subsequent risk for the negative mental health outcome of interest. This stress exposure model has received considerable empirical attention in relation to various forms of psychopathology strongly associated with NSSI. In particular, negative life events have been implicated in the pathogenesis of depression (Hammen, 2005; Stroud, Davila, & Moyer, 2008), and have been associated with increased risk for suicidal ideation (Fergusson, Woodward, & Horwood, 2000) and attempts (de Wilde, Kienhorst, Diekstra, & Wolters, 1992) in adolescent clinical samples.

Life stressors have been theorized to have a similarly prominent role as a proximal risk factor for NSSI (Nock, 2010). According to this theoretical model, when confronted with a stressful life event, certain individuals experience physiological hyperarousal in response. Such individuals prone to difficulties in emotion regulation may be particularly at risk for engaging in NSSI as a coping strategy. Yet, with the exception of research focusing specifically on childhood abuse and other severe early life adversities, few studies to date have directly examined the degree to which life stressors precipitate NSSI, particularly in adolescents. In one recent cross-sectional study, adolescents with a history of NSSI reported a higher lifetime rate of stressful life events than did those who did not engage in NSSI (Cerutti, Manca, Presaghi, & Gratz, 2011). Two large-scale cross-sectional studies similarly found life stressors within the past 12 months to be positively associated with NSSI in adolescents (Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2011; Garrison, Addy, McKeown, & Cuffe, 1993).

Although these studies are important in providing the first evidence of a relation between stressful life events and NSSI, longitudinal studies are needed to assess this relation over time. Two studies utilizing a longitudinal design have emerged in recent years. In one utilizing an adolescent inpatient sample, life stressors within the nine months prior to study enrollment interacted with depressogenic cognitive styles to predict greater NSSI 9 to 18 months later (Guerry & Prinstein, 2010). In a second study, a community sample of adolescents were asked about life stressors over the past three-month period, followed by an assessment six months later about NSSI over the past 2.5 years (Hankin & Abela, 2011). This study similarly documented a relation between life stressors and NSSI. In addition to these findings, greater physiological reactivity in response to a laboratory-induced stressor has been observed in adolescents who engage in NSSI (Nock & Mendes, 2008), which may be suggestive of a greater vulnerability in these individuals to the effects of naturally occurring life stressors.

Despite the consistent support from these initial studies regarding the role of negative life events in the pathogenesis of NSSI in adolescents, no study to date has examined the nature of this relation within a multi-wave longitudinal design. In contrast to previous research utilizing single- and two-time-point designs in measuring negative life events, this approach

allows for an idiographic rather than nomothetic assessment of the relation between this risk factor and NSSI. That is, rather than examining the relation between absolute levels of life stressors and NSSI, this approach evaluates whether within-person differences in life stressors is associated with within-person differences in NSSI. Such multi-wave research may also lend greater confidence in the temporal stability of this relation over time. Additionally, with the exception of one study (Hankin & Abela, 2011), past research has tended to employ a recall period for life events of over half a year. As recollection of minor to moderate life stressors tends to drop off perceptibly after approximately six months (Brown & Harris, 1982), more regular and briefer assessment intervals are required accurately to ascertain their relation to NSSI.

The current study thus aimed to add to the empirical literature by assessing the occurrence of negative life events and NSSI at three time-points over a nine-month period. The relation between these variables was specifically examined within a population of adolescents who were recruited during a psychiatric hospitalization. As rates of NSSI are notably higher in clinical samples than in community ones (Nock, 2010), the current study addressed the need for more research evaluating this relation in those particularly at risk for engaging in NSSI. Additionally, given that there is some support for girls being at greater risk for NSSI relative to boys (Jacobson & Gould, 2007; Prinstein et al., 2010), gender was treated as a covariate. Similarly, given previous findings linking depression to NSSI (Garrison et al., 1993; Hankin & Abela, 2011), depressive symptoms were assessed at each time-point and covaried. It was hypothesized that negative life events would be uniquely and positively associated with NSSI over and above female gender and concurrent depressive symptoms.

Method

Participants and Procedure

Participants were a subsample (n = 110) of a larger study (n = 143) examining longitudinal predictors of self-harm in adolescents hospitalized in an inpatient facility in the northeastern United States (Prinstein et al., 2008). Informed consent was obtained from parents, and assent from adolescents. The current study included only participants who completed study measures (i.e., assessments of depression symptoms, NSSI, and negative life events) at the three consecutive time-points for which the life events measure was administered, the least number of time-points required for conducting multi-wave longitudinal analyses: Time 1, Time 2 (six months after Time 1), and Time 3 (nine months after Time 1). Participants were 70.9% female, and between the ages of 12 and 15 years at Time 1 (M = 14.27; SE = .07). Approximately 75.5% of participants were Caucasian, 2.7% African-American, 3.6% Latino-American, and 18.2% mixed/other ethnicity.

Measures

Negative life events—Negative life events were assessed using the Life Events Checklist (LE-C). The LE-C is a 30-item measure based on several life event inventories developed for use with adolescents (see Coddington, 1972; Compas, Davis, Forsythe, & Wagner, 1987; Johnson & McCutcheon, 1980; Masten et al., 1988). Participants were asked whether each event had occurred in the past three months at Time 1, and since the previous time-point at

Times 2 and 3. At each time-point, salient dates (e.g., holidays and school-related events) were discussed with each adolescent so as to provide temporal anchors for the relevant time interval. For the purposes of the present study, a sum of the 20 items representing unambiguously negative life events was included in the analyses. As the LE-C is a checklist of discretely occurring items, internal consistency was not calculated (see Dohrenwend, 2006 for a discussion of this issue).

NSSI—NSSI was assessed using five items adapted from the Suicide Ideation Questionnaire (SIQ; Reynolds, 1985). These items measured the frequency on a 5-point scale (0 = "*never*" to 5 = "*almost every day*") that adolescents engaged in several types of self-injury without suicidal intent (i.e., cutting/carving skin, hitting themselves on purpose, pulling out hair, burning skin, or other methods). At each time-point, respondents reported NSSI behaviors for the preceding three months. For each time-point, a mean score of NSSI across all methods of NSSI was computed. Internal consistency was not calculated for this measure because the items assessed independently occurring types of NSSI (cf. Lynam, Miller, Miller, Bornovalova, & Lejuez, 2011; Nock, Holmberg, Photos, & Michel, 2007).

Depressive symptoms—Depressive symptoms were assessed using the Children's Depression Inventory (CDI; Kovacs, 1992). This measure contained 27 items, each of which is scored on a scale from 0 to 2. Items were summed with higher scores reflecting greater symptom severity. Cronbach's α across all three time-points ranged from .86 to .88.

Results

Hierarchic linear modeling (HLM; Raudenbush, Bryk, & Congdon, 2004) was conducted to examine between-person differences and within-person changes in NSSI and associated risk factors over time. HLM was chosen for its utility in analyzing longitudinal predictors of risk since it accounts for dependency in observations in data that are nested or multi-level in structure. Estimates are from population-average models using robust SEs from restricted maximum likelihood estimation.

A sizeable proportion of participants engaged in NSSI at least once at each time-point; 35.0% at Time 1, 22.8% at Time 2, and 28.4% at Time 3. Depressive symptom severity was generally consistent across all three time-points ($M_{Time\ 1} = 12.73$, $SE_{Time\ 1} = .81$; $M_{Time\ 2} = 12.94$, $SE_{Time\ 2} = .73$; $M_{Time\ 3} = 13.23$, $SE_{Time\ 3} = .82$). Additionally, average rates of negative life events were 3.55 ($SE = .25$) at Time 1, 2.91 ($SE = .22$) at Time 2, and 3.32 ($SE = .24$) at Time 3. Individuals who reported engaging in NSSI over the nine-month follow-up period also experience average higher rates of negative life events relative to those with no prospective occurrence of NSSI ($M_{NSSI} = 10.66$, $SE_{NSSI} = 1.02$, $M_{No\ NSSI} = 8.27$, $SE_{No\ NSSI} = .60$, $t = 2.15$, $p < .05$, $r_{effect\ size} = .23$).

For HLM analysis involving NSSI as the criterion variable, the within-person (i.e., time-varying) level evaluated whether wave-to-wave changes in depressive symptoms and negative life events were uniquely associated with wave-to-wave changes in NSSI, whereas the between-person (i.e., person-varying) level assessed whether gender predicted overall level of NSSI. Results of this multivariate analysis are summarized in Table 1. Female

gender predicted greater NSSI. Among the within-person variables, both greater depressive symptoms and negative life events were associated with greater NSSI.

Discussion

The current study provided the first assessment of negative life events as a risk factor for NSSI in adolescent inpatients within a multi-wave framework. Consistent with the study hypothesis, greater rates of negative life events was associated with greater engagement in NSSI, even after accounting for the effects of gender and concurrent depressive symptoms. These findings are consistent with, and build upon, previous cross-sectional and two-time-point studies examining the relation between these two variables (Garrison et al., 1993; Guerry & Prinstein, 2010; Hankin & Abela, 2011). Specifically, by employing an idiographic approach, we found that greater rates of life stressors, relative to an individual's average level of stress over the longitudinal assessment period, were associated with greater engagement in NSSI over the same time period.

It is important to note that engagement in NSSI is only one of several possible coping responses to distress experienced when confronted with a stressful life event. That is, most adolescents who experience a life stressor do not react by engaging in NSSI. Although it is generally conducted for intrapersonally (e.g., emotion regulation) and interpersonally (e.g., to draw social support) reinforcing reasons (Nock & Prinstein, 2004), why more adaptive coping strategies (e.g., engaging in pleasant activities with friends) are not pursued by certain adolescents warrants consideration. Drawing on stress-diathesis models of psychopathology, a plausible possibility is that only individuals with relevant underlying vulnerabilities engage in NSSI when exposed to stressful life events. Such predisposing characteristics may include poor interpersonal problem-solving skills (Nock & Mendes, 2008), excessive reassurance-seeking tendencies (Hankin & Abela, 2011) and rumination (Hilt, Cha, & Nolen-Hoeksema, 2008). Examining whether these dispositional characteristics moderate the tendency to engage in NSSI in response to stressful life events is a promising possibility for future research.

The current findings should be interpreted within the context of the study limitations. In particular, a self-report life events checklist was used in the current study. Despite the convenience and economy of self-report life event inventories, they are also subject to several methodological limitations, including a susceptibility to subjective or mood-congruent interpretative biases (Monroe, 2008). Future studies should utilize interview-based measures of life stressors, which are more immune to these limitations (McQuaid, Monroe, Roberts, Kupfer, & Frank, 2000) and would thus allow for a clearer evaluation of life stressors as a risk factor for NSSI.

The relatively low rate of life stressors within the current study should also be acknowledged. It is likely that some stressor subtypes naturally have a low base rate in adolescents (e.g., major physical health complaints). It is also possible, however, that some stressors may have been missed by our self-report checklist. That is, although we attempted to be comprehensive in the life events listed in the checklist, some relevant to the experiences of study participants may not have been included. Additionally, a common

limitation of self-report life event inventories is that they document whether a specific event has occurred, but not the number of occurrences. This too may have artificially deflated the observed rate of life stressors in the current study. As a consequence of their low rate of occurrence, we were unable to conduct fine-grained analyses examining the relation between specific subtypes of stressors (e.g., interpersonal, health-related, academic) and NSSI. Such distinction is potentially important inasmuch as certain stressors may be especially likely to precipitate NSSI in individuals prone to this behavior. Interpersonal stressors, in particular, may be pertinent given the often socially reinforcing nature of NSSI (Nock & Prinstein, 2005). Future studies with larger samples employing interview-based measures of life stressors over longer timeframes are needed to address this issue.

Additionally, the current study assessed life stressors over three consecutive time-points, which limited our multi-level analysis to a test of contemporaneous effects. It would be important for future research to assess life stressors and NSSI over more time-points so as to allow for time-lagged multi-level analyses and thus to clarify the temporal relation between these two variables. Indeed, in addition to the growing evidence implicating life stressors in the pathogenesis of NSSI, an interesting possibility yet to be examined is whether the relation between these variables may be transactional in nature. That is, just as life stressors may confer greater risk for NSSI, certain behavioral tendencies of individuals who engage in NSSI may likewise increase the likelihood of experiencing future stressors (i.e., stress generation; Hammen, 1991). That poor social problem-solving skills and excessive reassurance-seeking have been associated with NSSI (Hankin & Abela, 2011; Nock & Mendes, 2008) and stress generation (Liu, 2013) is certainly congruent with this possibility. Such a possibility may, in part, account for why adolescents with a history of NSSI are particularly at risk for future engagement in this behavior.

Insofar as life stressors serve as precipitants of NSSI in at-risk adolescents, the current findings have some clinical implications. Adolescents with an inclination to conduct NSSI when experiencing a stressful life event may benefit from treatment strategies involving the acquisition of more adaptive coping strategies. Given that NSSI has been associated with emotion dysregulation (Nock & Mendes, 2008; Nock, 2010), these individuals experience even relatively mild stressors as notably more distressing than do their peers. Thus, given the relative frequency of mild life stressors, treatment protocols that specifically target NSSI by supplanting it with healthier alternative means of coping may prove especially beneficial.

Acknowledgments

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Table 1

Multivariate hierarchic linear model of predictors of NSSI.

Predictors	Coefficient	SE	t	p	$r_{effect\ size}$
Within-Person					
Depressive Symptoms	.007	.002	3.019	.003	.210
Negative Life Events	.013	.006	2.234	.027	.158
Between-Person					
Female Gender	.054	.025	2.134	.035	.204