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Emotion Dysregulation Mediates the Relationship Between Child Maltreatment and Non-Suicidal Self-Injury

Elise N. Titelius,

Department of Psychology, Rhode Island College

Emily Cook,

Department of Psychology, Rhode Island College

Jayson Spas,

Department of Psychology, Rhode Island College

Lindsay Orchowski,

Warren Alpert Medical School of Brown University and Rhode Island Hospital

Katie Kivisto,

Warren Alpert Medical School of Brown University, Rhode Island Hospital and Bradley Hospital

Kimberly H. McManama O'Brien,

Warren Alpert Medical School of Brown University, Rhode Island Hospital and Bradley Hospital

Elisabeth Frazier,

Warren Alpert Medical School of Brown University, Rhode Island Hospital and Bradley Hospital

Jennifer C. Wolff,

Warren Alpert Medical School of Brown University, Rhode Island Hospital and Bradley Hospital

Daniel P. Dickstein,

Warren Alpert Medical School of Brown University, Rhode Island Hospital and Bradley Hospital

Kerri L. Kim, and

Warren Alpert Medical School of Brown University, Rhode Island Hospital and Bradley Hospital

Karen Seymour

Warren Alpert Medical School of Brown University, Rhode Island Hospital and Bradley Hospital

Abstract

One risk factor for non-suicidal self-injury (NSSI) in adolescents is exposure to traumatic experiences, particularly child maltreatment. However, the mechanisms through which childhood maltreatment predicts NSSI are largely unknown. Emotion dysregulation (ED) is likely an

Correspondence concerning this article should be addressed to: Karen E. Seymour, Ph.D. Division of Child and Adolescent Psychiatry, Johns Hopkins University School of Medicine, 716 North Broadway Street, Baltimore MD 21205. kseymou2@jhmi.edu. Ms. Titelius is now at Butler Hospital, Providence RI. Dr. Kivisto is now at University of Indianapolis School of Psychological Sciences. Dr. O'Brien is now at the Education Development Center, Inc., Boston Children's Hospital, Harvard Medical School. Dr. Seymour is now at Johns Hopkins University School of Medicine Division of Child and Adolescent Psychiatry and the Kennedy Krieger Institute Center for Neurodevelopment and Imaging Research.

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important mechanism in this relationship. Therefore, this study examined the relationship between childhood maltreatment, ED, and NSSI in a sample of adolescent inpatients (n= 53). Results demonstrated that child physical and emotional maltreatment, but not child sexual abuse, was significantly associated with NSSI frequency. More specifically, ED mediated the relationship between child physical and emotional maltreatment and NSSI frequency. Findings support the importance of ED as a mediating factor in the relationship between childhood maltreatment and NSSI behaviors and highlight the need for teaching emotion regulation skills to youth affected by trauma.

Keywords

adolescents; child maltreatment; child abuse; emotion dysregulation; non-suicidal self-injury; developmental psychopathology

Rates of non-suicidal self-injury (NSSI), defined as deliberate destruction of one's body in the absence of intent to die, have risen for adolescents over the past decade (Nock, 2010). Typical NSSI behaviors include: cutting, scraping skin, skin-picking, self-hitting and biting, burning, and tying (Andover, Primack, Gibb, & Pepper, 2010; Zetterqvist, Lundh, Dahlstrom, & Svedin, 2013). Studies of clinical samples show one- to two-thirds of adolescents have engaged in or contemplated some form of self-injury (Andover et al., 2010; Di Pierro, Sarno, Perego, Gallucci, & Madeddu, 2012; Muehlenkamp, 2006; Peterson, Freedenthal, Sheldon, & Andersen, 2008). Additionally, rates of NSSI are especially high in adolescents hospitalized for psychiatric treatment (e.g., Preyde et al., 2012). These rates are especially concerning in light of research indicating that individuals who engage in chronic, repetitive self-injury are at a higher risk for suicide than individuals not engaging in these behaviors (Whitlock & Knox, 2007). In fact, NSSI is associated with a 7-fold increase in the risk for suicide attempts, even when controlling for baseline depression and prior suicide attempts (Asarnow et al., 2011; Cox et al., 2012; Guan, Fox, & Prinstein, 2012).

While there are many risk factors for NSSI, exposure to traumatic experiences, including child maltreatment or abuse, is one important risk factor for NSSI (Ford & Gomez, 2015; Rus & Galbeaza, 2013). Although previous research demonstrates an association between child maltreatment and NSSI (Briere & Gil, 1998; Ford & Gomez, 2015; Rus & Galbeaza, 2013; Selby, Franklin, Carson-Wong, & Rizvi, 2013; Swannell et al., 2012; Voon, Hasking, & Martin, 2014), very little is known about the mechanisms that account for this association. One potential mechanism underlying this relationship is emotion dysregulation (ED; Ford & Gomez, 2015). Emotion regulation refers to "an individual's ability to modify an emotional state so as to promote adaptive, goal-oriented behaviors"(Thompson, 1994); therefore, ED refers to poor emotion regulation. Indeed, NSSI can serve as a maladaptive, yet effective method to regulate emotions (Nock, 2010) in that it may provide relief from emotional distress (Ford & Gomez, 2015).

Therefore, this study aims to clarify the relationship between childhood maltreatment, ED and NSSI. The current study examined correlations among study variables and then tested ED as a mediator in the relationship between childhood maltreatment and NSSI outcomes. It was hypothesized that: 1) Higher self-reported child maltreatment would be associated with

increased reports of NSSI, and 2) the relationship between child maltreatment and NSSI would be partially mediated by ED.

Method

Participants

Participants included 53 adolescents (ages 12–18), 81% female, recruited from inpatient units and partial hospital programs at a children's psychiatric hospital in the Northeastern United States. See table 1 for outlines of sample demographics and clinical characteristics.

Procedure

All appropriate Institutional Review Boards (IRB) approved the study. Participation was voluntary, and confidentiality was assured through a Federal Certificate of Confidentiality. After consent and assent procedures, participants completed a baseline assessment including intelligence screening, semi-structured diagnostic interview to assess psychopathology, and self-report questionnaires about mood and trauma exposure, ED, and NSSI.

Measures

Child maltreatment.—The *Childhood Trauma Questionnaire* (CTQ) (Bernstein & Fink, 1998) short form was used to measure physical, sexual and emotional abuse, as well as physical and emotional neglect. For this study, a factor analysis was conducted to examine the underlying factor structure of the CTQ given the high degree of relatedness between types of abuse and neglect, with results indicating that a 2-factor solution best fit the data. Specifically, physical and emotional abuse/neglect loaded on the first factor and sexual abuse loaded on the second factor. Therefore, the sexual abuse subscale ($\alpha = .80$) was used to form one construct, and a total scale score for the other four subscales ($\alpha = .76$) was used to form another construct for data analyses and was labeled “Child Physical and Emotional Maltreatment.”

Emotion regulation.—The *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004) total score was used to measure ED ($\alpha = .94$). For analyses, the total score was used, with higher scores reflecting greater ED.

NSSI Frequency.—A subscale of the *Self-Injurious Thoughts and Behavior Interview* (SITBI; Nock, Holmberg, Photos, & Michel, 2007) was used to measure NSSI acts. NSSI frequency was calculated based on the SITBI item asking how many times the participant engaged in NSSI in the past six months. If the participant did not engage at all in the past six months, then the response was coded as “0.”

Data Analytic Plan

All analyses were run in SPSS version 23 and AMOS 22.0. First, Pearson product-moment correlations were conducted between the variables of interest. Path analyses were run in AMOS 22.0, and standardized regression coefficients are reported. Model fit for path analyses was examined using the chi-square goodness of fit statistic, the comparative fit indices (CFI), and the root mean square error of approximation (RMSEA), as several fit

indices are recommended (Byrne, 2001). Accordingly, a non-significant chi-square indicated a good model fit, CFI values of .95 or higher indicated a good model fit and RMSEA values should be close to approaching zero, with values below .05 indicating a good model fit (Thompson, 2000). The significance threshold for all models was set at $p < .05$. Examination of mediation effects was conducted using the PROCESS macro for SPSS (Hayes, 2009).

Results

Correlational Analysis

Correlational analyses were conducted to examine the relationships among the variables of interest (See Table 2). Regarding demographics, gender was not related to any of the variables of interest. ED was positively related to child physical and emotional maltreatment ($r = .29, p = .03$), but not child sexual abuse ($r = .04, p = .77$). ED was also positively related to NSSI frequency ($r = .44, p = .001$). NSSI frequency was positively related to child physical and emotional maltreatment ($r = .29, p = .03$).

Path Analysis and Mediation Analysis

Model 1 (Figure 1) proved a good fit for the data $\chi^2 = 2.25, df = 4, p = .69$ (CFI = 1.00 and RMSEA = .000). Examination of the paths specified in the model indicated that physical and emotional maltreatment ($\beta = .28, p = .03$) but not sexual abuse ($\beta = -.005, p = .97$) predicted ED such that increased rates of physical and emotional maltreatment were associated with increased levels of ED. There was a non-significant trend for physical and emotional maltreatment to be associated with NSSI frequency ($\beta = .22, p = .08$), such that higher maltreatment was associated with increased report of engaging in NSSI in the last six months. There was also a non-significant trend for child sexual abuse to be negatively associated with NSSI frequency ($\beta = -.21, p = .08$). Further, ED was significantly predictive of NSSI frequency ($\beta = .37, p = .003$) such that increased levels of ED were associated with increased levels of NSSI frequency. Mediation analyses revealed that ED mediated the relationship between childhood physical and emotional maltreatment and NSSI frequency (effect = .386, CI: .0431–1.177).

Discussion

While NSSI is a known risk factor for suicidality, and exposure to child maltreatment increases the risk for NSSI (Kaess et al., 2013), the mechanisms underlying this relationship are largely unknown. The present study addressed this concern by testing the role of ED as a potential mediator of this relationship. As hypothesized, child physical and emotional maltreatment, but not sexual abuse, was significantly associated with NSSI frequency. Further, ED mediated the relationship between child physical and emotional maltreatment and NSSI frequency.

Results suggesting a significant relationship between child emotional and physical maltreatment and NSSI frequency are consistent with some prior literature (Di Pierro et al., 2012; Gratz & Chapman, 2007; Yates, Carlson, & Egeland, 2008). In contrast, sexual abuse was not associated with NSSI, consistent with a meta-analysis that reported only a small relationship between NSSI and childhood sexual abuse (Klonsky & Moyer, 2008). Indeed,

this meta-analysis showed that when psychological risk factors (e.g., depression, insecure attachment, dissociation, etc.) were controlled for, the relationship between NSSI and sexual abuse became non-significant. That said, there were limited reports of childhood sexual abuse in this sample, suggesting that a relationship might still exist in a larger sample where childhood sexual abuse has a higher endorsement rate. Taken together, results offer partial support for the literature examining the associations between childhood maltreatment and NSSI.

The main finding was that ED mediated the relationship between child physical and emotional maltreatment and NSSI frequency. Theoretical models of NSSI (Klonsky, 2007; Nock, 2010) have suggested that NSSI may occur as a means of handling negative emotions. In fact, some research has proposed that the functions of NSSI include: emotional relief, generation of feelings secondary to emotional numbing or physical anesthesia and/or self-punishment secondary to guilt or shame (Turner, Chapman, & Layden, 2012). Therefore, individuals experiencing negative emotions, which may be associated with childhood physical or emotional maltreatment, may turn to NSSI as a coping mechanism. In fact, Burns, Jackson, and Harding (2010) found that children who experienced physical and emotional abuse had significantly lower levels of ER. Furthermore, some research has shown that individuals with significant ED respond in a maladaptive way (e.g., engagement in NSSI) to decrease an emotional experience (Gratz, 2003; Zeman, Cassano, Perry-Parrish, & Stegall, 2006).

Results emphasize the need for clinicians to teach adolescents, particularly those who have experienced a trauma, positive emotion regulation strategies and distress tolerance skills in order to decrease the likelihood of maladaptive emotion regulation strategies, such as NSSI.

Limitations and Future Research

The current study has some limitations. First, the study used data from a relatively small sample of adolescents receiving intensive services, and male participants were under-represented. Therefore, the findings should be considered preliminary until replicated with a larger clinical sample that includes more males. Second, correlational data were used to test a causal model. As such, future research should utilize a longitudinal design while considering other possible mediators (e.g., depression, life stressors, etc.). Third, self-report measures were used which compromises validity because responses may be biased by their current state of ED; as such, the respondents may under- or over-report the severity of their physical and emotional maltreatment. Finally, as noted previously, rates of sexual abuse were limited within the sample. Therefore, the lack of a relationship between sexual abuse and NSSI may reflect this lack of variance rather than a true null finding. Future studies should re-examine this relationship in a sample reporting greater variance in levels of sexual abuse.

Overall, this study helps elucidate the role of ED in NSSI engagement for maltreated youth. Given that 77% of this sample endorsed engaging in NSSI at least once in six months, results underscore the importance of assessing and treating ED in adolescents. Future research should also examine which ER strategies are most successful at ameliorating NSSI behaviors in youth who have experienced trauma.

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Figure 1. This model demonstrates the relationship among child maltreatment, emotion dysregulation, and NSSI intensity. Standardized regression weights are presented.

* $p < .05$, ** $p < .01$, $N = 53$

Figure 1.

The relationship between child maltreatment, ED and NSSI frequency

Table 1.

Participant Characteristics (n=53)

Characteristic	Mean (SD)
Age, years	14.60 (1.47)
CTQ Child Physical and Emotional Maltreatment score	35.79 (12.08)
CTQ Sexual Abuse score	6.45 (4.10)
DERS Total score	19.71 (3.90)
NSSI Frequency (in last 6 months)	31.31 (42.66)

Note. CTQ = Childhood Trauma Questionnaire, DERS = Difficulties with Emotion Regulation Scale; NSSI = non-suicidal self-injury.

Table 2.

Correlations between study measures

Variables	1	2	3	4	5
1. Gender					
2. Child Physical and Emotional Maltreatment	.121				
3. Child Sexual Abuse	.018	.243			
4. Emotion Dysregulation	.072	.283 *	.041		
5. NSSI Frequency (6 months)	.065	.294 *	.162	.436 **	

Note. NSSI = non-suicidal self-injury.

*
 $p < .05$

**
 $p < .001$