

Expectancies for Social Support and Negative Mood Regulation Mediate the Relationship between Childhood Maltreatment and Self-Injury

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Abstract

Nonsuicidal self-injury (NSSI) is common among young people. A majority of individuals who injure themselves do so to alleviate negative affect, as most self-injurers report difficulties with mood regulation. Trauma in childhood is an important risk factor that may cause individuals to develop poor interpersonal relations and impaired emotion-regulation, leading to the use of non-adaptive coping strategies such as NSSI.

This study examined factors contributing to self-injury, focusing on the link from childhood maltreatment, through mood regulation expectancies and expectancies for social support (father, mother, and friends), to self-injury. Understanding how these variables relate to NSSI is crucial for early identification of individuals at risk of NSSI. Participants were 377 Japanese university students. Lifetime prevalence of self-injury was 20% among the sample.

Results showed childhood maltreatment is a strong predictor that increases the risk for NSSI. However, expectancies for social support and mood regulation seem to be potential protective factors. Mood regulation expectancies mediate the relationship between childhood maltreatment and self-injury. In addition, expectancies for social support were indirectly linked with NSSI through negative mood regulation expectancies. It appears that perceived support from father and friends increases one's confidence in regulating difficult emotions, which in turn reduces risk for NSSI. Results suggest that strong expectancies for social support, especially from friends, increase one's confidence in regulating emotion, which contributes as a protective factor against self-injury.

Keywords: self-injury, childhood maltreatment, mood regulation, social support

Self-injury represents a maladaptive response to intolerable emotional pain. Non-suicidal self-injury (NSSI) refers to the direct, deliberate destruction of one's own body tissue without the intent to die (Nock & Favazza, 2009); it does not include drug or alcohol overdoses (Pattison & Kahan, 1983). Self-injury methods range from methods that cause little tissue damage (e.g., pinching, hair pulling) to methods that cause severe tissue damage (e.g., cutting, burning) (Nixon & Heath, 2009). In Japan, the rate of NSSI cases among young adults in university samples has been between 7% and 38% (Yamaguchi et al., 2004; Gotoh & Sato, 2006). A number of studies of self-injury have demonstrated a strong link between childhood maltreatment and later mood regulation difficulties (e.g. Cloitre, Stovall-McClough, Miranda, & Chemtob, 2004; Paivio & McCulloch, 2004; Tresno, Ito, & Means, 2012). Trauma in childhood has also been considered an important factor in later self-injury (Matsumoto, Azekawa, Yamaguchi, Asami, & Isekiet, 2004). There is some evidence that children ignored by their caregiver may have serious negative impairments for later ego-control, affect expression, and emotion regulation, which have been implicated in the etiology of self-injuring behavior (Gratz, Conrad, & Roemer, 2002).

Over the years, the question of why people purposely harm themselves has been investigated by researchers in self-injury literature. Individuals who report a history of self-injury often tend to report maltreatment and neglect (Paivio & McCulloch, 2004; Van der Kolk, Perry, & Herman, 1991). Trauma during childhood may contribute to a vulnerability that prevents the child from learning effective skills to cope with emotional distress, which may result in using of NSSI as an ineffective coping method (Nock, 2009). In addition, these individuals may have impaired interpersonal relationships and less trust in people that keep them from seeking help from others (Connors, 2000).

Pepin and Banyard (2006) were interested in the effects of social support on the development of college students who had been maltreated in the past. The authors found that a history of childhood maltreatment related negatively to perceived social support and developmental outcomes, such as trust, autonomy, and intimacy. In Paivio and McCulloch's (2004) study, alexithymia, the inability to identify and communicate one's feelings, mediated the relationship between childhood trauma and self-injury. Insufficient parental support among individuals with maltreatment and a neglectful environment created an incapacity to regulate emotion among Canadian college students, as the children did not learn effective ways to cope with their negative emotions. Without healthy coping strategies during stressful times, individuals with maltreatment histories are at risk of maladaptive coping, such as self-injury (Paivio & McCulloch, 2004).

In Japan, emotional or psychological maltreatment has been less studied. Unlike physical abuse that results in visible injuries such as bruises, cases of psychological maltreatment may be hidden from the community (Yamamoto, Iwata, Tomoda, Tanaka, Fujimaki, & Kitamura, 1999). Gotoh and Sato (2006) replicated Paivio and McCulloch's (2004) study among Japanese undergraduate students but found mood regulation difficulties did not mediate the relationship between child maltreatment and self-injury status. No association was found between mood regulation difficulties and self-injury, or between maltreatment and mood regulation difficulties.

The effects of perceptions of family and peer support on self-injury have been less researched (Heath, Ross, Toste, Charlebois, & Nedecheva, 2009). Recent studies report that having family members or friends who provide support may reduce the risk of self-injury. Fortune et al. (2008) found that having someone to talk to, who listened to their problems and provided

support, prevented individuals from engaging in self-injury. Students were more likely to consider talking to family members and friends as a source of support than talking to mental health professionals. In childhood maltreatment studies, survivors of child abuse who reported greater levels of social support tended to show better psychosocial skill following maltreatment, such as developing more trust or autonomy (Pepin & Banyard, 2006). Self-injuring individuals who reported feeling connected to and supported by their parents appeared better able to cope with stressors and to avoid more serious suicidal risk (Muehlenkamp & Gutierrez, 2007; Muehlenkamp, Brausch, Quigley, & Whitlock, 2013). In NSSI, non-self-injuring university students reported significantly greater friend support than did students who engaged in self-injury (Heath et al., 2009).

Crowell, Beauchaine, and Linehan (2009) suggested that emotional difficulties foster and maintain self-injury in an unsupportive social environment. Social support can be seen as one of the potential mediators that may decrease the harmful effects of stress and enable individuals to carry out their social functions (Kim, Lee, & Kim, 2009). A lack of supportive resources may increase the intensity of negative emotions, which in turn are regulated through NSSI as a maladaptive coping style (Klonsky, Muehlenkamp, Lewis, & Walsh, 2011). In a study of an adolescent psychiatric sample, Adrian and colleagues (2011) revealed that insufficient support from, and more conflict with, peers was indirectly associated with NSSI severity through mood regulation. They examined an integrated model of the associations among family problems, peer problems, mood regulation, and self-injury. Another study by Muehlenkamp and colleagues (2013) mirrored this finding, showing that poor mood regulation connected interpersonal difficulties with self-injury. However, childhood maltreatment was not a focus of their study.

Previous studies have identified that negative mood regulation expectancies (NMRE) buffer the effect of child maltreatment on self-injury frequencies (e.g. Tresno, Ito, Mearns, 2013). NMRE represent people's confidence that they can alleviate negative affect. The risk of self-injury is increased by the presence of distal factors, such as childhood maltreatment, that may lead to vulnerabilities or impaired capacities to respond to life stress appropriately (Nock, 2009). Even so, it is not clear how the associated risk factors may lead to self-injury, either alone or in combination with other factors (Nock, 2010).

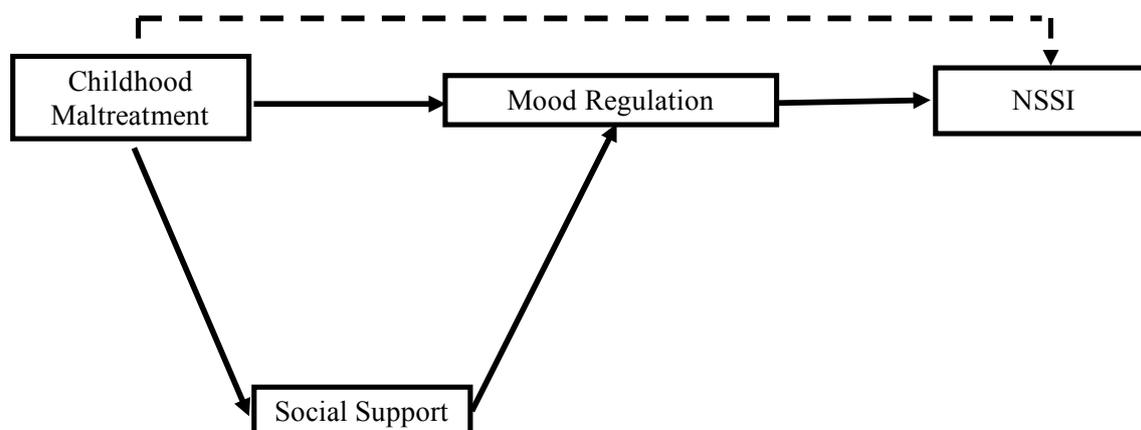
Despite the prevalence of NSSI, why people engage in self-injury still remains unclear. Research examining factors influencing the development of NSSI is important for improving prevention efforts (Nock, 2009), particularly in terms of understanding how maltreatment may contribute to self-injury (Klonsky et al., 2011). Adding interpersonal factors such as perceived social support to emotion regulation is considered important for explaining how self-injury is maintained (Muehlenkamp et al., 2013; Nock, 2008).

The current study intended to examine the links among childhood maltreatment, mood regulation expectancies, expectancies for social support, and self-injury among NSSI and non-self-injury (NoSI) groups. Furthermore, the current study examined the links among factors contributing to the maintenance of self-injury in a single model, focusing on the roles of mood regulation expectancies and expectancies for social support.

Figure 1 shows the hypothesized model. We expected that greater maltreatment experiences would be associated with poorer mood regulation expectancies and lower expectancies for social support. In addition, that mood regulation expectancies would be an intervening variable in the relationship between child maltreatment and NSSI. We also predicted that

insufficient social support would indirectly predict NSSI through mood regulation expectancies.

Figure 1: Proposed Model of the Pathway to Self-Injury



Method

Participants

Data from 377 Japanese undergraduate students in the Aichi prefecture, enrolled in psychology classes, were analyzed in this study. Participants ranged from age 18 to 25, with a mean age of 19 years ($SD = .87$); 52% were men and 46% women. Participants completed the anonymous self-report questionnaires voluntarily in class. The procedure to carry out the current study was reviewed and approved by the Research Ethics Board of the University.

Measures

Nonsuicidal self-injury (NSSI). NSSI was measured using a short form of Self-injurious Thoughts and Behaviors Interview (SITBI) that assesses presence, frequency, and characteristics of self-injurious behavior (Nock, Holmberg, Photos, & Michel, 2007). The SITBI has demonstrated strong inter-rater reliability, test-retest reliability, and concurrent validity. For the purpose of this study, only the items related to NSSI were used; they were modified to measure the frequency of using 11 self-injury methods, emphasizing “purposely hurting yourself without wanting to die,” the necessity of receiving medical treatment, and the reason for harming oneself “as a way to get rid of bad feelings,” “in order to feel something,” “to communicate with someone else or to get attention,” or “to get away from others.” This scale was translated into Japanese by Tresno et al. (2013).

Childhood maltreatment. The Child Abuse and Trauma (CAT) scale (Sanders & Becker-Lausen, 1995) is made up of fairly general questions about the frequency of different past experiences participants may have suffered as children and teenagers; it assesses the severity of maltreatment and neglect in the home. Thirty-two items were translated into Japanese (Tresno et al., 2013). Responses range from 0 (*never*) to 4 (*always*). An overall score was obtained by averaging responses to all 32 items. The total CAT had satisfactory internal consistency ($\alpha = .89$). The overall CAT score was used in the analyses.

Mood regulation expectancies. The Negative Mood Regulation Scale-Japanese (NMR-J) assesses participants' beliefs in their ability to alleviate the negative moods they experience. Negative mood regulation expectancies predict adaptive coping and buffer the effects of stress, resulting in less negative affect (Mearns et al., 2016). Starting with the stem "When I'm upset, I believe that..." the 40-items are rated on a 5-point scale from *strongly disagree* to *strongly agree*. Higher scores reflect greater confidence that one can regulate one's negative emotions. The internal consistency for the NMR-J in this sample was high ($\alpha = .88$).

Expectancies for social support. The Scale of Expectancy for Social Support (SESS; Hisada, Senda, & Minoguchi, 1989) consisted of 16 items, assessing participants' expectation of receiving emotional social support from others. For the purpose of this study, participants separately rated the items describing types of emotional support provided by father, mother, and friends. Total expectancy for social support was the sum of perceived support from all three sources. Internal consistency was excellent for the SESS total scale ($\alpha = .97$).

Results

Twenty percent of participants ($n = 75$) reported engagement in at least one episode of self-injury (51% women, 48% men). Age of those with a first self-injury episode ranged from 6 to 19 years old, with an average age of 13 years ($SD = 3.02$). Most of the self-injurers (89%) harmed themselves more than one time, and 76% reported multiple methods. Four percent had received medical treatment.

The most frequently endorsed self-injury methods were hitting oneself (59%), pulling out hair (45%), picking at a wound (44%), cutting or carving skin (40%), biting oneself (20%), scraping skin (15%), inserting objects under nails or skin (7%), picking areas of body to the point of drawing blood (7%), burning (1%), and others (9%), such as kicking or punching a wall. Forty-three percent of participants who engaged in self-injury reported having injured themselves within the past year. A chi-square test was performed for participant gender: gender was not related to self-injury, $\chi^2(1, 366) = .71, n.s.$

Regarding underlying reasons for harming themselves, the majority of participants endorsed "to get rid of bad feelings" (65%); others endorsed "to feel something" (17%), "to get away from others" (19%), "to communicate with someone else or to get attention" (15%). Twenty-eight percent endorsed other reasons, such as to make other people worry, to punish oneself, to feel worthless, and to restrain oneself from wanting to die.

Comparing NSSI and non-self-injury (NoSi) groups revealed that individuals with a self-injury history reported a significantly higher level of maltreatment in childhood, poorer NMRE, and less expectation of social support from father compared to the non-self-injury group. As shown in Table 1, pairwise comparisons showed that there were significant differences between the two groups for the level of child maltreatment, NMRE, total social support, and father's social support. The non-self-injury group reported higher expectancies for social support from mother and friends; however, these differences were not significant.

Table 1: Comparisons between NSSI and NoSI Groups

	NSSI		NoSI		<i>t</i>
	<i>(n = 75)</i>		<i>(n = 281)</i>		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
CAT	37.37	(17.37)	32.12	(13.83)	<i>t</i> (352) = 2.73**
NMRE	116.42	(15.33)	127.35	(17.59)	<i>t</i> (351) = -4.82***
Total SESS	136.81	(26.46)	143.72	(25.94)	<i>t</i> (362) = -2.01*
SESS Father	41.08	(13.65)	44.27	(11.39)	<i>t</i> (365) = -2.06*
SESS Mother	47.52	(11.91)	49.47	(10.45)	<i>t</i> (370) = -1.30
SESS Friends	47.95	(9.29)	50.02	(8.94)	<i>t</i> (371) = -1.77

Note. NSSI = Nonsuicidal self-injury. NoSI = Non-self-injury. CAT = Child abuse and trauma. NMRE = Negative mood regulation expectancies. SESS = Scale of Expectancies for Social Support

* $p < .05$. ** $p < .01$. *** $p < .001$.

Pairwise correlations were calculated to examine the associations between lifetime NSSI frequencies and other variables. As expected, lifetime NSSI frequencies were negatively correlated with childhood maltreatment and negative mood regulation expectancies. However, no significant correlation was found with any social support subscale. The CAT correlated negatively with NMRE and social support: overall social support expectancies, father, mother, and friends (see Table 2). Results suggest that individuals with childhood trauma are at risk for impairment in mood regulation expectancies and interpersonal relationships. Associations between NMRE and social support expectancies were positive: More confidence in one's ability to regulate one's mood significantly related to great confidence in receiving overall social support, and support from father, mother, and friends.

Table 2: Inter-correlations of NSSI Frequencies and Other Variables

	1	2	3	4	5	6	7
1 NSSI							
2 CAT	.15**						
3 NMRE	-.15**	-.27**					
4 Total SESS	-.07	-.37**	.40**				
5 SESS Father	-.07	-.35**	.32**	.87**			
6 SESS Mother	-.05	-.40**	.30**	.89**	.70**		
7 SESS Friends	-.05	-.16**	.41**	.71**	.38**	.49**	

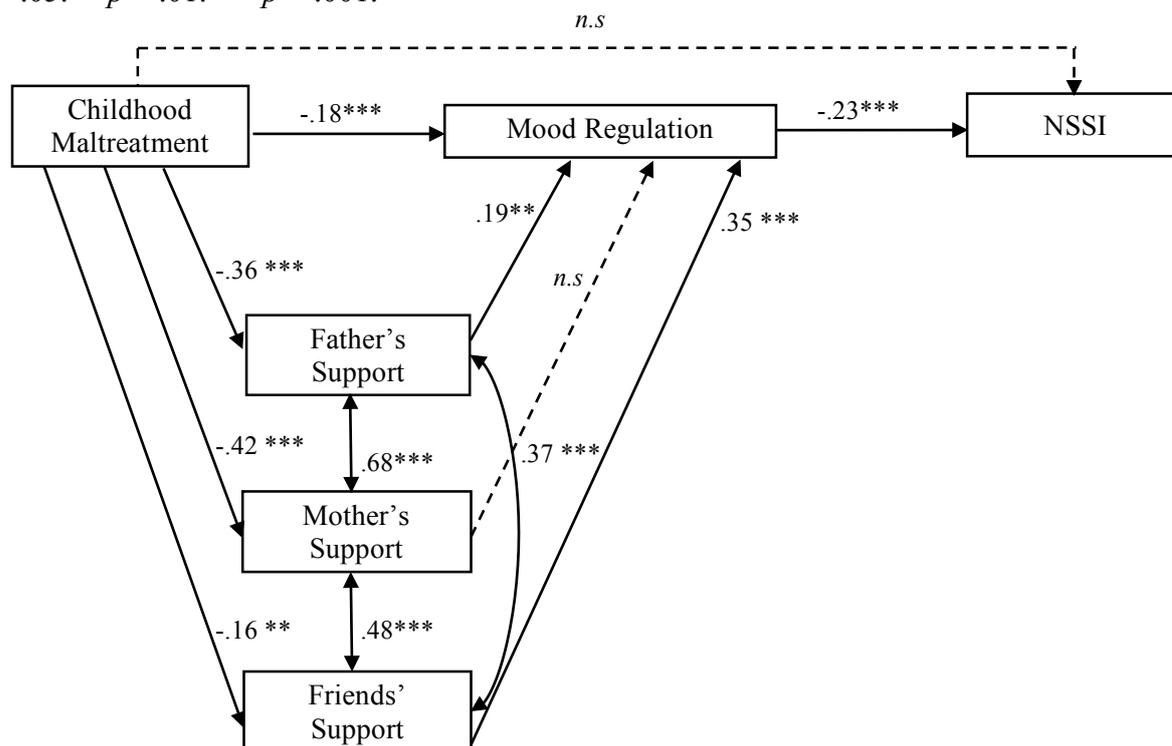
Note. NSSI = Nonsuicidal self-injury. CAT = Child abuse and trauma. NMRE = Negative mood regulation expectancies. SESS = Scale of Expectancies for Social Support.

** $p < .01$.

Path Analysis

We created a path model using AMOS to understand the connection between child maltreatment and self-injury and their links with NMRE and social support expectancies. This analysis required complete data for all participants (Byrne, 2010), leaving a total of 324 participants. NSSI was entered as a categorical variable: NSSI versus NoSI. This model showed a good fit to the data, yielding an overall $\chi^2(4) = 2.42$, $p = .66$. Model fit statistics were: Goodness-of-Fit-Index (GFI) = .99, Comparative Fit Index (CFI) = 1.00, and Root Mean Square Error of Approximation (RMSEA) = .00, which is within the acceptable range (Byrne, 2010).

Figure 2: Standardized Path Coefficients between NSSI, CAT, NMRE, and SESS.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The path analysis indicated that maltreatment in childhood was indirectly related to self-injury through NMRE (Figure 2). There was a direct effect between childhood maltreatment and NSSI (unstandardized coefficient = .01, standardized coefficient = .12, $p = .03$) before adding NMRE to the model. After adding NMRE, NSSI was directly predicted by poor mood regulation (unstandardized coefficient = -.01, standardized coefficient = -.23, $p = .001$). There was a direct effect of child maltreatment on NMRE (unstandardized coefficient = -.22, standardized coefficient = -.18, $p = .001$), and all subscales of expectancies for social support expectancies, father (unstandardized coefficient = -.29, standardized = -.36, $p = .001$), mother (unstandardized coefficient = -.31, standardized coefficient = -.42, $p = .001$), and friends (unstandardized coefficient = -.10, standardized coefficient = -.16, $p = .004$). More maltreatment in childhood was directly associated with lower expectancies for regulating emotions as well as indirectly through lower expectancies for receiving social support. In addition, there was a direct prediction of increased confidence in regulating emotion by greater expectancies for social support from father (unstandardized coefficient = .28, standardized coefficient = .19, $p = .008$) and from friends (unstandardized coefficient = .68, standardized coefficient = .35, $p = .001$).

Tests of indirect effects were used to evaluate intervening variables. The direct effect between childhood maltreatment and NSSI was diminished after adding NMRE (standardized coefficient = .06, $p = .31$). More maltreatment and neglect during childhood predicted impairment in mood regulation expectancies, which then predicted NSSI. Supporting Paivio and McCulloch's (2004) findings, these results suggest that impairment in regulating one's emotions is an intervening variable in the relationship between childhood trauma and self-injury (standardized indirect effect = .06, $p = .001$). All social support subscales were not directly related to self-injury, but greater expectations of being supported by father, and especially by friends, were related to increased confidence in affect regulation (social support

from mother showed no significant association with NMRE.) In turn, greater confidence in regulating one's emotions was associated with reduced risk of engaging in NSSI.

Discussion

Understanding why people intentionally harm themselves is necessary for several reasons. This understanding may aid identification of individuals at risk for other unhealthy coping strategies, such as alcohol or drug abuse (Nock, 2010). Results of the present study revealed that 20% of Japanese young adults had injured themselves at least once in their lifetime; the main reason was to cope with negative feelings.

A majority of NSSI individuals reported multiple episodes and multiple methods. Although other NSSI studies commonly reported cutting the skin with sharp objects as the most frequent method, including among Japanese (e.g., Yamaguchi et al., 2004), in the current sample self-hitting was the most endorsed NSSI method. Ross and Heath (2002) found that hitting oneself was the second most common form of self-injury, following cutting. The average age of onset was 13 years, in line with the literature, which reports an average age of first NSSI between 13 and 15 (e.g., Muehlenkamp & Gutierrez, 2007; Ross & Heath, 2002).

In this study, associations among variables paralleled other scholars' findings of childhood maltreatment as a risk factor for self-injury and other impairment, such as reduced expectations for being able to regulate one's emotions and of social support (Cloitre et al., 2008; Paivio & McCulloch, 2004). Both trauma in childhood and lower confidence in regulating one's negative emotions were linked to an increased risk of engaging in NSSI as an unhealthy coping strategy. NMRE and expectations for social support were positively associated. This result was similar to Kim et al.'s (2009) finding that support from colleagues and family was helpful for regulating negative emotions. However, similar to Heath, Ross et al. (2009), no relationship was found between self-injury frequencies and expected social support from parents or friends. Lower expectancies for social support were not directly linked to self-injury.

There were significant differences between groups with and without NSSI in the levels of childhood maltreatment and NMRE. Consistent with Paivio and McCulloch (2004), NSSI individuals reported a more negative home environment in childhood and more mood regulation difficulties. For social support, only overall scores and perceived support from father significantly differed between groups. As suggested by Fortune et al. (2008), having a family member or friend who provides care and support may reduce the risk of NSSI. In Japan, traditionally fathers spend more time at work and remain emotionally distant from the family at home (Tamura, 2001). It seems that scenarios where a father has more communication and greater involvement with the family, or becomes closer to his children are associated with more positive development, such as higher confidence that one can cope with negative affect.

A path analysis testing the variables in a single model revealed that NMRE intervened in the relationship between childhood maltreatment and self-injury. As hypothesized, maltreated children appear to develop deficits in regulating emotions, which result in difficulties coping with painful negative feelings. Difficulties regulating negative emotions appear to increase the likelihood of engaging in NSSI. More severe maltreatment predicted lower mood regulation confidence, which predicted greater NSSI. Moreover, in line with Adrian and

colleagues' (2011) finding, insufficient friend support directly related to impaired mood regulation expectancies, which then predicted NSSI.

Not all individuals who are maltreated in the past develop mood regulation difficulties (Alink, Cicchetti, Kim, & Rogosch, 2009). Many studies have suggested that social support from family or friends can be a strong protective factor against suicide risk or unhealthy behavior (e.g., Brausch & Gutierrez, 2010; Eskin, 1995). In the current study, childhood maltreatment appeared to reduce one's confidence about getting emotional support from others; however, social support variables were not directly linked with self-injury. The current study suggests that social support contributes to increasing one's confidence in regulating difficult emotions. This is particularly true for support from father and friends. Thus, there is an indirect link between expectancies for social support and NSSI, through the influence of social support expectancies on NMRE. It appears that feeling connected to and supported by family and friends increases the likelihood of coping better with unpleasant emotions, and of avoiding the risk of NSSI or other unhealthy behaviors (Muehlenkamp & Gutierrez, 2007).

Many previous researchers have suggested that being maltreated in childhood may contribute to interpersonal vulnerabilities, such as a lower capacity for supportive interpersonal experience (e.g., Cloitre et al., 2004). Future research on the effects of social support as protecting factors that increase resiliency in those who have suffered childhood maltreatment should be done.

Limitations

The present study has several limitations. First, there are limitations related to the generalizability of the findings, as the rate of NSSI in the sample was relatively small. Furthermore, there were missing data, especially for self-injury frequencies. A complete data set was needed for path analysis; thus NSSI was entered as a categorical variable to maximize number of participants. Second, there is the potential bias that may occur in a self-report study. Third, the sample may not be representative of all Japanese university students. Fourth, the current study used the total score of childhood maltreatment to identify maltreatment history. Examining different forms of childhood maltreatment separately may give different results. Fifth, the size of the direct effect between child maltreatment and NMRE in the path analysis, while significant, is relatively small (-.18).

Conclusion

The current study adds to the literature on NSSI among young adults by showing the link between childhood maltreatment and NSSI through important factors of mood regulation expectancies and expectancies for social support from father, mother, and friends. The findings of the current study revealed several important implications for understanding why people harmed themselves and showed a glimpse into how these factors may increase the risk for NSSI. Understanding the links between maltreatment, expectancies for social support and NMRE in a single model may help schools and health professionals to improve intervention efforts.

Perceived social support may serve as a protective factor against the negative effects of childhood maltreatment, helping one develop better confidence for dealing with negative emotions and better abilities to cope with distress, which may reduce the risk of using

maladaptive coping. It is necessary to provide healthy support networks, especially early prevention efforts in junior high school, the average age of first occurrence of NSSI, and to assist vulnerable children to cope with difficulties.

Childhood maltreatment increases the risk of self-injury among abuse survivors. Trauma in childhood may lower adaptive skills for regulating emotion, which increases the use of maladaptive coping such as NSSI. However, greater emotional support expectancies from friends may enable maltreatment survivors to build more confidence and learn more adaptive ways to cope with emotional distress. Believing that someone will provide emotional support is important to building more positive coping, which in turn lowers the risk for self-injury or suicide. A supportive environment, especially comprising family and friends, may also help to develop positive and adaptive coping abilities when facing stressful events, which in turn may reduce the use of flawed coping behavior. These findings can be applied to the early identification and intervention of self-injury or other maladaptive behavior.

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