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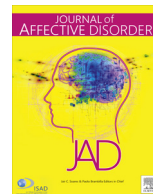
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## Research paper

## Direct and indirect forms of childhood maltreatment and nonsuicidal self-injury among clinically-referred children and youth



Jenna. Armiento\*, Chloe A. Hamza, Shannon L. Stewart, Alan Leschied

Faculty of Education, Western University, 1137 Western Road, Canada, N6G 1G7

## ARTICLE INFO

## Article history:

Received 8 February 2016

Received in revised form

7 April 2016

Accepted 16 April 2016

Available online 20 April 2016

## Keywords:

Nonsuicidal self-injury

Self-harm

Childhood maltreatment

Witnessing domestic violence

Sexual maltreatment

Physical maltreatment

## ABSTRACT

**Background:** Although exposure to direct forms of childhood maltreatment is among the most widely studied risk factors for nonsuicidal self-injury (NSSI), research on NSSI has largely overlooked the role of exposure to indirect forms of child maltreatment (i.e., witnessing domestic violence). To address this gap in the literature, the present study examined associations among both direct and indirect forms of child maltreatment and NSSI among clinically-referred children and youth.

**Methods:** Data was collected using the interRAI Child and Youth Mental Health Assessment (ChYMH) at ten mental health agencies. The ChYMH is a comprehensive standardized clinical assessment tool completed by trained assessors using multiple sources. The study included a convenience sample of 747 children and youth (68% male) between ages 8–18 with complex mental health histories referred for inpatient or outpatient care in Ontario, Canada.

**Results:** Univariate chi-square analyses indicated positive associations with NSSI and both direct (i.e., physical, sexual) and indirect child maltreatment (i.e., witnessing domestic violence). In a binary multivariate logistic regression analysis controlling for participant age and sex, only exposure to indirect child maltreatment emerged as multivariate predictor of NSSI.

**Limitations:** The sample was limited to only 10 mental health agencies and only consenting parents/guardians referred to mental health services suggesting the study may not be generalizable to all clinical samples.

**Conclusion:** The present study provides evidence that witnessing domestic violence in childhood is an important risk factor for NSSI. Clinical relevance includes implications for clinicians to develop targeted intervention and prevention strategies for NSSI for children who have witnessed domestic violence.

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Nonsuicidal self-injury (NSSI) is defined in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* as direct and deliberate bodily harm in the absence of suicidal intent (American Psychiatric Association, 2013) and includes behaviours such as cutting, scratching of skin, head-banging and biting. NSSI typically emerges between the age of 12–15 years, and recent reviews suggest that as many as 18% of adolescent community-based samples engage in NSSI (Muehlenkamp et al., 2012; Plener et al., 2015; Swannell et al., 2014) and as many as 37% of clinical samples meet the DSM-5 criteria for NSSI-disorder (Groschwitz et al., 2015; In-Albon et al., 2013). Although exposure to direct forms of childhood maltreatment (i.e., physical abuse, sexual abuse) is among the most widely studied risk factors for NSSI, research on NSSI has largely overlooked the role of exposure to indirect forms of child maltreatment. In particular, researchers have yet to examine whether witnessing domestic violence (i.e., an indirect form of child

maltreatment) may be associated with an increased risk for NSSI. To address this significant gap in the literature, the present study examined associations among direct maltreatment (i.e., physical, sexual), indirect maltreatment (i.e., witnessing domestic violence) and NSSI among a sample of clinically-referred children and youth. Importantly, identifying family factors associated with NSSI engagement, will inform clinical care planning for children and youth.

*Childhood Maltreatment.*

Childhood maltreatment includes direct forms (e.g., physical, sexual) as well as indirect forms of abuse (e.g., neglect, witnessing domestic violence), and is a prevalent issue that is experienced by many children across North America (Sedlak et al., 2010). In the most recent Canadian Incidence Study of Reported Child Abuse and Neglect (CIS), there were approximately 235,842 reported childhood maltreatment-related incidents investigated in 2008 (Trocmé et al., 2010). This data is only representative of cases reported to child welfare and does not include those reported to police or not reported, suggesting the actual number of incidents

\* Corresponding author.

E-mail address: [jarmient@uwo.ca](mailto:jarmient@uwo.ca) (Jenna. Armiento).

of childhood maltreatment in Canada is estimated to be significantly higher. According to the CIS report (2008), neglect and witnessing domestic violence are the most commonly reported forms of maltreatment experienced by children and youth (34%), followed by physical abuse (20%), emotional abuse (9%) and sexual abuse (3%).

Childhood maltreatment has been associated with numerous short-term and long-term negative outcomes (Fitzgerald and Berliner, 2014; Webster, 2013; Widom, 2014). Children who are maltreated are more likely to develop mental health problems such as depression, anxiety and substance use in young adulthood (Dion et al., 2016; Khan et al., 2015; Scott et al., 2012). Moreover, it has been determined that previous childhood maltreatment can lead to intrapersonal problems such as decreased self-esteem, as well as increased risk for re-victimization of abuse as an adult (Auslander et al., 2016; Widom, 2014). Due to the multiple negative consequences of childhood maltreatment, researchers are working to fully understand the effects that maltreatment has on the child's mental health and well-being.

#### *Childhood Maltreatment and Nonsuicidal Self-Injury.*

Several recent studies have underscored the role of family factors in the prediction of NSSI (Baetens et al., 2015; Tatnell et al., 2014; for a review see Arbutnott and Lewis, 2015). In particular, one of the most widely studied risk factors for NSSI is early childhood maltreatment. Research suggests that childhood maltreatment may be an important predictor in the development of NSSI (for a review see Ford and Gómez, 2015), and as many as 79% of children and youth with a history of some form of childhood maltreatment engage in NSSI (Yates, 2009). The link between childhood maltreatment and NSSI, however, may vary depending on the type of maltreatment (for a review see Lang and Sharma-Patel, 2011). Indeed, several studies have found that adolescents who experience childhood sexual abuse report higher rates of NSSI than adolescents without a history of sexual both (both retrospectively and longitudinally; Auerbach et al., 2014; Gonçalves et al., 2015; Rabinovitch et al., 2015; Wan et al., 2015); however, a meta-analysis of the studies on sexual abuse and NSSI suggests the association between NSSI and child maltreatment is modest (Klonsky and Moyer, 2008). In contrast, childhood physical abuse has been associated with NSSI in some studies (Heath et al., 2009; Gonçalves et al., 2015; Wan et al., 2015) but not in others (Auerbach et al.; Rabinovitch et al., 2015). Even fewer studies have examined the effects of emotional abuse and neglect but what little evidence is available has suggested a significant association with NSSI (for a review see Lang and Sharma-Patel, 2011).

Another type of childhood maltreatment that has not been examined in association with NSSI is witnessing domestic violence. In Canada, domestic violence has been found to occur more commonly than other types of maltreatment; as many as 1 in 3 substantiated childhood maltreatment cases includes children witnessing their parents physically abusing each other during childhood, most commonly male on female violence (Black et al., 2008; Trocmé et al., 2010). One reason witnessing violence has not been examined further is that witnessing domestic violence is not considered a form of child abuse in certain jurisdictions in Canada. Specifically, the Risk Assessment Model for Child Protection in Ontario (Ontario Association of Children's Aid Societies, 2000), which is a provincial strategy to protect children who have been abused, states that parenting behavior should be regarded as abusive if the child is present and *physically* suffers as a result. However, recent research has revealed that exposure to domestic violence is associated with a variety of mental health problems including depression, low self-esteem, post-traumatic stress disorder (PTSD) symptoms, poor school performance, and aggressive behaviours (Artz et al., 2014; Blair, McFarlane et al., 2015; Lourenço et al., 2013; Public Health Agency of Canada, 2008). Since

witnessing domestic violence is considered to have such prominent effects on children, more research is needed to elucidate the effect of witnessing domestic violence on child and youth mental health.

#### *The Present Study.*

Although there is increasing evidence that direct childhood maltreatment, particularly sexual abuse, is associated with engagement in NSSI, little research has focused on indirect forms of maltreatment in relation to NSSI. In the present study, we addressed this gap in the literature by examining whether exposure to direct and indirect forms of childhood maltreatment are associated with NSSI engagement among clinically-referred children and youth. More specifically, we examined associations among sexual abuse, physical abuse, witnessing domestic violence (which has been overlooked in the literature), and NSSI. We predicted that both direct and indirect forms of childhood maltreatment would demonstrate positive associations with NSSI engagement, underscoring the importance of developing targeted intervention strategies for children and youth with both direct and indirect child maltreatment histories.

## 1. Methods

### 1.1. Participants

The present study was conducted through ten community mental health facilities across Ontario, Canada. In total, 913 children (68% males) between the ages of 4–18 years and their caregivers participated in the assessment as part of a larger ongoing study. Given that the ChYMH was being piloted as a standard of care in 10 selected mental health agencies, the participant response rate was very strong (approximately 85% of referrals completed the assessment at time of intake into clinical care). Parents gave informed consent for participation and assessments were completed by trained assessors. Since children as young as 4 years of age are unlikely to engage in self injury with specific intent that would fit the definition of NSSI, the present study was restricted to examining children between the ages of 8–18 years ( $N=747$ ). This age range also coincides with the most common age of onset for NSSI (Glenn and Klonsky, 2009). The average age of the 747 children (68% male) included in the analysis was 12.02 years ( $SD=2.73$ ). Most children lived at home (90%) with a parent or guardian at time of referral, although 19% had lived in foster home prior to referral. Forty-four percent of caregivers were married, whereas the remainder of parents were never married (18%), living with a partner (5%), separated (11%), divorced (14%) or widowed (2%; 6% were unknown). Among participating families, 35% of children referred had a preliminary diagnosis of anxiety, 56% had a preliminary diagnosis of attention-deficit hyperactivity disorder, 14% had a preliminary diagnosis of mood disorder, 25% had a learning/communication disorder and 14% had a preliminary diagnosis of autism. Less than 4% of the sample had preliminary diagnoses of eating disorders, sleep or adjustment disorders, psychosis, and reactive attachment.

### 1.2. Measures

The measure used for the present study was the interRAI Child and Youth Mental Health Instrument (ChYMH; Stewart et al., 2015). The ChYMH instrument is one of many instruments within an integrated assessment system developed through an international collaborative that is working to improve the quality of life for vulnerable persons (i.e., interRAI). The ChYMH addresses many of the weaknesses found in other child and youth assessment tools, and provides a comprehensive, multi-source approach to

examine mental health issues and a broad range of common mental health problems (Stewart et al., 2015). The ChYMH assessment is completed by a trained assessor using a semi-structured interview format. Assessors are required to interview the child and the child's primary caregiver, examine teacher referrals or notes, observe the child, as well as conduct a clinical case review. The ChYMH builds a comprehensive picture of individuals' mental health needs, over all functioning, and areas of risk to inform care planning for clients. Rigorous reliability and validity studies have been conducted across the family of interRAI instruments, displaying strong psychometric properties for adults (Burrows et al., 2000; Martin et al., 2007; Morris et al., 2000., Perlman and Hirdes, 2008), as well as children and youth (e.g., Stewart et al., 2015; Phillips et al., 2012; Phillips and Hawes, 2015). Inter-rater reliability of the interRAI instruments were assessed and the average agreement was 83% for all interRAI mental health items (Hirdes et al., 2003; Hirdes et al., 2008).

### 1.3. Demographics

Age at time of the assessment was assessed in years, and sex was reported (1 = female, 2 = male).

### 1.4. Nonsuicidal self-injury

NSSI was assessed using the Severity of Self-Injury Scale on ChYMH (Stewart et al., 2015). The Severity of Self-Injury Scale has been shown to demonstrate strong inter-rater reliability, and convergent validity in previous research (Hirdes et al., 2003; Hirdes et al., 2008). The ChYMH defines self-injury (specifically within the assessor manual) as the deliberate and intentional act of self-injury that requires the child's awareness that his or her actions may have a harmful outcome to him or herself. For example, a young child accidentally wandering out onto the road is not considered a self-injurious attempt if it only reflects the child's inability to understand the harmful consequences of his or her action. Similarly, non-intentional, accidental or unconscious self-destructive behavior would not be considered as self-injurious. In contrast, if the child has the capacity to understand the dangers of his or her actions (e.g., child understands walking into the road is dangerous, but does so deliberately) that would be regarded as self-injurious. Assessors were asked to evaluate the recency of any self-injurious act by the child, including both lethally motivated suicidal behavior and behavior that inflicts self-injury without suicidal intent (e.g., self-cutting, burning, head-banging, etc.) on a 5-point Likert scale (0 = Never, 1 = More than a year ago, 2 = 31 days – 1 year ago, 3 = 8–30 days ago, 4 = 4–7 days ago, 5 = In the last 3 days). For the purposes of the present study, a dichotomous variable was created (0 = no self-injury, 1 = history of self-injury). Assessors were also asked to inquire about whether the child had ever engaged in lethality motivated suicidal behavior (e.g., intentional self-inflicted attempt to end one's own life; 0 = no suicidal attempt, 1 = suicidal attempt). Since NSSI includes direct and deliberate harmful behaviours in the absence of suicidal intent, only children with no previous suicidal attempts were included NSSI group, and participants with a suicidal attempt were excluded ( $N=60$ ). Previous studies have also used a similar method for categorizing NSSI in previous research (e.g., Muehlenkamp and Gutierrez, 2004).

### 1.5. Childhood maltreatment

This component of the assessment required assessors to examine whether the child had experienced physical abuse, sexual abuse, or witnessed domestic violence (as assessed by child/youth report, teacher report, parent/guardian report, clinical charts, clinical

observations), as well as indicate how recently this event occurred (0 = never, 1 = more than a year ago, 2 = 31 days to a year ago, 3 = 8–30 days ago, 4 = 4–7 days ago, 5 = in last 3 days). In the ChYMH, physical abuse was defined as any form of physical abuse experienced by the child, regardless of the age in which the incident occurred and included behaviours such as any incident resulting in non-accidental injury, physical confinement, excessive physical discipline and withdrawal of necessities such as food or water. Sexual abuse was defined as any form of sexual abuse/assault experienced by the child, regardless of his or her age when the incident occurred and included behaviours such as exposure of genitals, sexual touching and rape. Lastly, witnessing domestic violence was defined as the child is aware of, has knowledge of, or has witnessed physical or verbal actions or threats towards another family member. The presence of physical abuse (0 = no, 1 = yes), sexual abuse (0 = no, 1 = yes) and witnessing domestic violence (0 = no, 1 = yes) were coded and included in the present study.

### 1.6. Plan of analysis

Statistical analyses were conducted using SPSS Statistics 23. Data was analyzed using Chi-square analyses, one way analysis of variance (ANOVA), and binary logistic regression. First, bivariate analyses using Chi-square tests were conducted to examine the associations between NSSI and the categorical variables of sex, sexual abuse, physical abuse, and witnessing domestic violence. An ANOVA was used to compare the mean age at the time of assessment for those youth who engaged in NSSI versus those who did not engage in NSSI. Third, binary logistic regression analysis was used to predict the presence/absence of NSSI from the predictors of age, sex, sexual abuse, physical abuse and witnessing domestic violence. The goodness of model fit was assessed by calculating the Hosmer-Lemeshow test with nonsignificant Chi-square values indicating good fit (Hosmer-Lemeshow, 1989).

## 2. Results

Of the 747 children and youth, 177 (23.70%) indicated that they had previously engaged in NSSI and 510 (68.30%) did not engage in NSSI. There were 60 participants with unknown NSSI history. With respect to maltreatment, 73 (9.80%) of children reported experiencing sexual abuse, 124 (16.60%) of children reported experiencing physical abuse and 210 (28.10%) reported witnessing domestic violence.

### 2.1. Bivariate analysis of sample characteristics by NSSI

Results from Table 1 provide the Chi-square test of association between NSSI and the categorical variables. At the bivariate level, a number of explanatory variables were found to be significant. There was a significant association between sex and NSSI  $\chi^2(1)=12.60$ ,  $p < .001$ , sexual maltreatment and NSSI  $\chi^2(1)=17.73$ ,  $p < .001$ , physical maltreatment and NSSI  $\chi^2(1)=13.23$ ,  $p < .001$ , and witnessing domestic violence and NSSI  $\chi^2(1)=15.29$ ,  $p < .001$ . In terms of the bivariate analysis between NSSI and age at time of assessment, age was found to be significantly associated with NSSI,  $F(1)=38.87$ ,  $p < .001$ . The mean age of children and youth who engaged in NSSI was 12.90 years, whereas the mean age of those who did not engage in NSSI was 11.50 years, suggesting that older children were more likely to engage in NSSI than younger children.

### 2.2. Multivariate logistic regression

A binary logistic regression analysis was used to determine if sexual abuse, physical abuse, and witnessing domestic violence

**Table 1**  
Chi square test results comparing NSSI versus no NSSI.

Variables	NSSI n (%)	No NSSI n (%)	Chi square (sig)
Sex			12.598 (< .001)
Male	105 (15.3%)	375 (54.6%)	
Female	72 (10.5%)	135 (19.7%)	
Sexual Abuse			17.732 (< .001)
Yes	28 (14.7%)	29 (42.3%)	
No	149 (21.7%)	481 (70.0%)	
Physical Abuse			13.227 (< .001)
Yes	43 (6.3%)	65 (9.5%)	
No	134 (19.5%)	445 (64.8%)	
Domestic violence			15.288 (< .001)
Yes	69 (10.0%)	121 (17.6%)	
No	108 (15.7%)	389 (56.6%)	

Note: N = 687 (youth with a suicidal attempt were excluded).

predicted NSSI engagement. Age and sex were included in the model as covariates. A test of the full-model against a constant-only model was statistically significant, indicating that the predictors as a set of variables, reliably distinguished between those youth who engaged in NSSI and those who did not engage in NSSI ( $\chi^2=62.878, p < .001, df=5$ ). Model fit was evidenced by a non-statistically significant Hosmer-Lemeshow test,  $\chi^2(n=687)=4.67, df=8, p=.79$ . The full model correctly classified 75.8% of the cases. Of the three predictors in the model (physical abuse, sexual abuse, witnessing domestic violence), only witnessing domestic violence significantly predicted NSSI engagement (Wald = 4.703,  $df = 1, p=.03$ ). The odds ratio for witnessing domestic violence indicated that, as experiences of witnessing domestic violence increased, children were 1.6 times more likely to engage in NSSI. The presence of direct forms of maltreatment (i.e., sexual abuse, physical abuse) was not associated with NSSI engagement in the multivariate model. Table 2 presents the results for the model including the regression coefficients, Wald statistics, odds ratio and 95% confidence intervals for the odds ratios.

### 3. Discussion

Although research related to the impact of physical and sexual maltreatment on children and youth and its potential relation to the development of NSSI has been widely studied (Ford and Gómez, 2015; Klonsky and Moyer, 2008; Lang and Sharma-Patel, 2011), there is a paucity of research on the impact of witnessing domestic violence in its relation to NSSI. This is despite widespread evidence that witnessing domestic violence carries with it numerous significant consequences for the adjustment of child, including mental health and behavioral problems, as well as an increased risk for the expression of violence by those same young

**Table 2**  
Logistic regression results predicting NSSI.

Predictor	B	Wald Chi-Square	Odds ratio (ExpB)	P value	95% Confidence interval
Age	.177	25.167	1.194	.000	[1.114, 1.280]
Sex	.607	9.642	1.836	.002	[.371, .799]
Sexual abuse	.471	2.163	1.601	.141	[.333, 1.169]
Physical Abuse	.306	1.295	1.358	.255	[.435, 1.248]
Domestic Violence	.468	4.703	1.596	.030	[1.046, 2.435]

people (for a comprehensive overview of the literature to date see Artz et al., 2014). To address this gap in the literature, and disentangle the potential impact of direct and indirect forms of maltreatment, we examined whether physical abuse, sexual abuse, and witnessing domestic violence were associated with an increased risk for NSSI engagement among clinically-referred children and youth. Consistent with previous research examining NSSI among child and adolescent inpatient samples, approximately 24% of our sample engaged in NSSI (Groschwitz et al., 2015). We also found that physical and sexual abuse were associated with NSSI engagement in our univariate analyses. It is interesting to note, however, that in our multivariate analysis only witnessing domestic violence was a significant predictor of NSSI engagement, underscoring the importance of monitoring children and youth who have witnessed domestic violence for risk for NSSI. The present findings also strongly underscore the need to incorporating trauma-informed intervention and targeted prevention efforts for high risk children and youth.

Consistent with previous research, we found that females and older children/youth were more likely to engage in NSSI than males and younger children/youth. Indeed, several studies have reflected that adolescent females are more likely to engage in NSSI than adolescent males (Bresin and Schoenleber, 2015; Gandhi et al., 2015; Sornberger et al., 2012), although some studies suggest these differences are less pronounced in adulthood (Andover et al., 2010). We also found that the average age of participants in the NSSI group was 13, compared to participants without a history of NSSI (age=11.5). Given that the typical age of onset for NSSI is 12–15 years old (Swannell et al., 2014), it is not surprising that older participants were at increased risk for NSSI, relative to younger children/youth.

Although physical and sexual maltreatment were associated with increased risk of NSSI engagement in the univariate analyses, only witnessing domestic violence emerged as a multivariate predictor of NSSI. There is evidence to suggest that witnessing domestic violence may increase risk for NSSI through the social modelling of behavior. More specifically, Lemmey et al., (2001) found that after witnessing domestic violence, children's mothers reported an increase in the child's aggressive behaviours (i.e., hitting, fighting). It could be that children engage in NSSI as a way to model the aggressive behaviours of their caregivers, but that these behaviours are self-directed. Alternatively, research has also consistently shown that NSSI serves as a way to regulate aversive negative emotions (e.g., stress, anxiety, fear, sadness; see Hamza and Willoughby, 2015 for a review of this literature). Children witnessing domestic violence, therefore, may turn to NSSI as a form to regulate the overwhelming negative emotions associated with witnessing domestic violence.

Our finding that witnessing domestic violence was more strongly associated with NSSI engagement than physical and sexual maltreatment could be explained by the fact that physical and sexual maltreatment were experienced less frequently in the present sample than witnessing domestic violence (i.e., less power to find significant effects). In a recent study, however, researchers also found that witnessing domestic violence, as well as witnessing physical abuse of a sibling, led to more externalizing behaviours than the children who were directly physically abused (Renner, 2012). One explanation could be that children witnessing domestic violence may have more frequent abuse exposures (i.e., number of abuse episodes) than children who have experienced sexual or physical abuse, which could lead to more frequent episodes of distress. Alternatively, an explanation as to why witnessing domestic violence was significant could lie in the ambiguous nature of loss and helplessness that is experienced when a child witnesses a caregiver being abused that is not experienced through direct victimization. Regardless, our findings highlight the

important association between NSSI and witnessing domestic violence, which has been previously overlooked in past research.

### 3.1. Limitations and future research directions

Despite the many strengths of the present study including a large sample size of clinically-referred youth, and the use of a comprehensive multi-sourced assessment approach, the current study is not without limitations. First, the sample was limited to children and youth in 10 mental health facilities from Ontario, Canada. These facilities specialize in mental health issues for children and youth with complex and diverse mental health needs, which may not be generalizable to community samples. Moreover, only consenting parents/guardians of children and youth referred to the mental health facilities were included in this study, so the present sample may not be representative of all referrals to those agencies. It is also important to note that we specifically examined youth with a history of NSSI, who had not made a suicidal attempt. Our decision to examine NSSI specifically, was a result of recent efforts to specifically differentiate NSSI from suicidal behavior in the DSM-5 (American Psychiatric Association, 2013), as well as increasing consensus that only self-injurious behaviours without any lethal intent can be characterized as NSSI (for a review see Hamza et al., 2012). As a result, however, our findings may not be generalizable to youth who engage in NSSI and have a history of suicidal attempts.

Second, it is also noteworthy that self-report by the youth and parent/guardian was used to assess both NSSI, as well as the presence of the different forms of maltreatment (i.e., physical, sexual, witnessing domestic violence). Although self-report is the most commonly used way to assess self-injurious behaviours (Swannell et al., 2014), retrospective self-report assessments are subject to recall biases (e.g., under reporting self-injury episodes). Similarly, research has demonstrated that parents/guardians will often under report or fail to disclose maltreatment experiences, particularly when retrospective reports are utilized (Shaffer et al., 2008; Widom and Shepard, 1996). In an effort to reduce the impact of under reporting of both NSSI and maltreatment, multiple sources of information were used in the ChYMH assessment in addition to the youth and parental reports (i.e., teacher report, clinical reports, and observation). Moreover, youth and parents were asked to report on behaviours that occurred quite recently (e.g., NSSI within three days prior to assessment) to reduce difficulties with recall, as well as behaviours that occurred in the past. Regardless, it is possible that both NSSI and maltreatment are under reported in the present the study, and that our results may not be generalizable to all families of youth who have engaged in NSSI or experienced maltreatment (e.g., families who do not disclose maltreatment histories). In the future, it also will be important to assess the frequency and severity of NSSI episodes, specifically, to examine whether the link between childhood maltreatment and NSSI may vary depending on the level of NSSI engagement.

Third, the present study is cross-sectional in nature, and therefore the direction of effects cannot be assessed. More specifically, on the basis of previous research and theory we predicted that exposure to maltreatment would be associated with increased risk for NSSI engagement. Indeed, prominent theories of parenting suggest that an early invalidating childhood environment, may lead to increased risk for self-criticism and emotion dysregulation, which in turn may lead to increased risk for self-injury (Linehan, 1993). Similarly, recent research has shown that poor parental relationship quality is associated with increased risk of NSSI onset over time, suggesting parenting factors may contribute to risk for NSSI (Arbuthnott and Lewis, 2015; Hamza and Willoughby, 2014; Tatnell et al., 2014). Given that we could not specifically address

the direction of effects in the present study, however, it is possible that our findings suggest that parents are more likely to maltreat children with a history of self-injury. In particular, self-injury may be highly stressful for parents, which could lead to increased marital conflict (an in severe cases, domestic violence). To disentangle the nature of association between childhood maltreatment and NSSI, future longitudinal research is needed.

### 3.2. Implications and conclusions

The findings of the present study have important implications for mental health research and practice. In particular, our study provides compelling new evidence that experiencing indirect forms of childhood maltreatment, particularly witnessing domestic violence, is associated with increased risk for NSSI engagement. Despite increasing research on the role of direct forms of maltreatment (see Lang and Sharma-Patel, 2011 for a review), our study lends support to the notion that even more subtle forms of childhood maltreatment can have damaging effects on a child's emotional well-being. Indeed, it was found that witnessing domestic violence was more strongly associated with NSSI than direct forms of self-injury (i.e., physical and sexual abuse). Our findings are consistent with an increasing body of literature that suggests that witnessing domestic violence may be as strongly associated with aversive outcomes for children as direct forms of abuse (Artz et al., 2014). In Canada, children who witness domestic violence are less likely to receive care from Child Welfare Services in Canada than children who experience abuse directly (Black et al., 2008); however, our findings underscore that children who experience domestic violence should be given the same access to care as children who experience other forms of direct maltreatment. Moreover, our findings suggest that clinicians should inquire about both direct and indirect forms of maltreatment at the time of clinical intake, and explore if the child has experienced vicarious trauma via witnessing domestic violence. Importantly, treatment for children and youth who have witnessed domestic violence, should also include trauma-informed practices and preventative strategies for these at-risk youth, in an effort to circumvent NSSI engagement.

### Acknowledgements

Dr. Chloe Hamza would like to acknowledge that she received postdoctoral funding from the Canadian Institutes of Health Research to conduct this research (Funding Reference Number: 140862). Dr. Shannon Stewart would like to acknowledge funding from the London Community Foundation, and Volunteer Organization from CPRI.

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