



# Self-reported nonsuicidal self-injury (NSSI) and sex as self-injury (SASI): Relationship to abuse, risk behaviors, trauma symptoms, self-esteem and attachment



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## ABSTRACT

This study focuses on a conceptually unexplored behavior among adolescents who report deliberately using sex as a means of self-injury. In a large high school-based sample ( $n = 5743$ ), adolescents who engaged in sex as self-injury (SASI,  $n = 43$ ) were compared to adolescents who reported direct nonsuicidal self-injury (NSSI,  $n = 933$ ) and those who reported both NSSI and SASI ( $n = 82$ ). Results showed that significantly more adolescents with SASI had experience of penetrating sexual abuse, as well as more sexual partners compared to those with NSSI. The SASI group also had higher levels of self-reported trauma symptoms, such as dissociation, posttraumatic stress and sexual concerns compared to those with NSSI, suggesting a distinct relationship between sexual abuse, trauma symptoms and engaging in sex as self-injury. There was no difference between the SASI and NSSI groups regarding experiences of emotional and physical abuse, self-esteem, parental care or overprotection or symptoms of depression, anxiety and anger. Adolescents who engaged in both NSSI + SASI stood out as a more severe and burdened group, with more experience of abuse, risk behaviors and impaired psychosocial health. Adolescents with traumatic experiences such as sexual abuse need to be assessed for SASI and vice versa.

## 1. Introduction

A new and relatively unexplored area of interest, potentially in the field of self-injury, has developed from recent clinical reports and testimonies from adolescents and young adults who describe deliberately using destructive sexual activities as a means of self-injury (Jenstäv and Meissner, 2016; Jonsson and Lundström Mattsson, 2012). The definition and conceptualization of this behavior is still at an early stage. One definitional suggestion was put forward in a report from the Swedish Children's Welfare Foundation (Jonsson and Lundström Mattsson, 2012): “when one has a pattern of seeking sexual relations involving psychological or physical harm to oneself...” (p.19). The report was based on clinical experience and interviews with adolescents and professionals. Interviews showed that the key force underlying sex as self-injury (SASI) was the presence of unbearable feelings, especially intense anxiety. In an empirical study of young women selling sex, the women described that one reason for selling sex was to regulate affect. Some of the interviewed young women reported that the sexual activity

involved physical pain, and compared selling sex to cutting themselves, which they also had experience of (Jonsson et al. (2015)). In a recently published paper, Fredlund et al. (2017) investigated the prevalence of self-reported sex as self-injury among 5750 Swedish students in their third year of Swedish high school ( $M = 18.0$  years,  $SD = 0.60$ ). Among these adolescents, 3.2% of the girls and 0.8% of the boys reported having experience of engaging in SASI.

Self-injurious behaviors (SIB) are usually categorized into direct or indirect forms, with nonsuicidal self-injury (NSSI), including behaviors such as cutting and burning skin, being an example of the former, and binge eating or other examples of maltreating oneself as examples of the latter. Direct NSSI is of special interest due to its inclusion in section III of the fifth version of the diagnostic and statistical manual of mental disorders (DSM-5; American Psychiatric Association, 2013), defined as at least five days of intentional self-inflicted damage to the surface of the body during the last year. The behavior should not be socially sanctioned, and should be performed without suicidal intent.

The direct and indirect behaviors share the self-damaging aspect of

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bodily harm, but differ with regard to the immediate damage to body tissue as a consequence of the self-injury (Hooley and St. Germain, 2014; Nock, 2010; St. Germain and Hooley, 2012). Despite differences, there are similar elements present in these behaviors. Nock (2010) suggests that “they all represent attempts to modify one’s affective/cognitive or social experience, they cause bodily harm, and they are associated with other forms of mental disorders...” (p. 343). The aspect of modifying affective and social experience, as described by Nock, has in fact been shown in a recent empirical study which examined the functions of NSSI and SASI, respectively (Jonsson et al., 2017). Adolescents with SASI confirmed that the behavior was performed mainly to regulate affect, supporting functional equivalence in these topographically different behaviors. There were, however, some differences, where more adolescents with SASI reported social influence functions compared to those with NSSI (Jonsson et al., 2017). It has also been shown in a study on the same sample that the majority (70% of girls and 55.6% of boys) of those who used sex as a form of self-injury reported pain associated with the activity, thus potentially involving bodily harm (Fredlund et al., 2017). Briere et al. (2010) describe self-injury, and also what they refer to as dysfunctional sexual behavior, as tension reduction behaviors that function as a form of avoidance (to avoid thoughts and feelings related to stressful events). They also found an association between dysfunctional avoidance and experience of interpersonal trauma.

Since the self-injurious behavior of interest in this study is the use of sex as a means to self-injure indirectly, a pertinent question arises as to whether adolescents engaging in SASI have potentially negative experiences in the domain of sex, as this is the specific behavior chosen to regulate affective and social experiences (Jonsson et al., 2017). Fredlund et al. (2017) found in their study that sexual abuse, especially penetrative abuse, was more common in the SASI group compared to the reference group. Previous studies have pointed to a tendency for sexual risk-taking behaviors to be a consequence of sexual abuse (Lalor and McElvaney, 2010; Rosenberg et al., 2001). It is therefore of special interest to explore different experiences of sexual abuse and sexual risk-taking behaviors among these adolescents, compared to those with more direct forms of self-injury.

Potential differences between adolescents with these different kinds of SIB have not previously been compared using the same sample of adolescents. This study builds further on earlier work on the same study sample, by exploring the association between SASI in adolescents and other highly relevant variables, such as sociodemographic background, risk behaviors, experience of abuse and psychosocial health. It thereby contributes further empirical data to the ongoing process of conceptualizing and defining SASI. Hopefully it will also increase understanding as to why adolescents deliberately engage in activities that are harmful to themselves.

The aim of the present study was to compare adolescents who reported having engaged in SASI to adolescents who reported direct NSSI only, and those who reported both NSSI and SASI, by examining whether there were differences between these groups with regard to demographics, health-related risk behaviors (selling sex, early sexual debut, more than 10 sexual partners, no protection during last intercourse, alcohol and drug use and health care for eating disorders or suicide attempts), experience of abuse (physical, emotional and/or sexual), and psychosocial health (psychological health, self-esteem and attachment). Based on the sexual nature of the self-injurious behavior of SASI, we hypothesized that this group would have more experience of sexual abuse and sexual risk-taking compared to those with direct NSSI. We further hypothesized that adolescents with multiple forms of self-injury (NSSI + SASI) would present with the most psychopathology. For the other measures the analyses were explorative, since there is a lack of earlier research on this issue. Adolescents who did not report any SIB were also shown for comparison.

## 2. Method

### 2.1. Participants

The current study was based on a representative sample of Swedish high school seniors in their third year at Swedish high school. In Sweden about 91% of all 18-year-old adolescents were enrolled in Swedish high schools, according to data from 2013 (Statistics Sweden, 2014). The agency Statistics Sweden selected participating schools on the basis of school size and study programs according to the National School Register for the second year of Swedish high schools for the autumn of 2013. Based on the existing 1215 Swedish high schools, 261 were chosen, from which one or two study programs at each school (out of 21 national programs) were selected to constitute a proportional and representative selection of participating students. Ultimately, 13,903 adolescents from the 261 schools were selected for the study. Of the 261 schools selected, 238 were still in existence and still provided the selected programs in 2014. Finally, 171 schools with 9773 adolescents agreed to participate in the study. Of the 9773 adolescents that had the opportunity to participate, 5873 completed the questionnaire. Thirty-four questionnaires were excluded due to unserious answers or a high amount of missing data, leaving 5839 adolescents. This gave a response rate of 59.7%. Mean age of the participating adolescents was 17.97 ( $SD = 0.63$ ). Ninety-six adolescents did not answer the NSSI and/or the SASI question, which was necessary for participation in the current study and they were thus excluded, resulting in a total of 5743 adolescents. For demographic information see Table 1.

### 2.2. Procedure

Statistics Sweden selected the sample and distributed and collected the questionnaires. Information about the study was sent to the principals of the selected schools by mail in August 2014. Participating schools answered the questionnaire in digital format (by computer in 165 schools) or on paper (six schools). Information about the study was given to the principals, the teachers in charge when the questionnaires were completed and the students. The students gave informed consent to participate in the study by answering the questionnaire. All participants were over the age of 15 and according to the Ethical Review Act of Sweden, parental consent is not required when adolescents are 15 years or older. The data was collected anonymously and no participants could be identified. Afterwards they received written information about where to turn for help and support if needed after answering the questionnaire.

### 2.3. Ethics

The study was approved by the Regional Ethical Review Board of Linköping (Dnr, 131–31).

### 2.4. Measures

The questionnaire used in the present study was a modified version of the questionnaire used in two previous studies that were carried out in 2004 and 2009 (Svedin and Priebe, 2004, 2009). It comprised 116 main questions. In the present study questions were used that related to sociodemographic background, self-injury, experiences of abuse, risk behaviors, health and relationship with parents.

#### 2.4.1. Non-suicidal self-injury (NSSI)

In the current study, only the first general question from the self-injurious thoughts and behaviors interview-short form-self report (SITBI; Nock et al., 2007) was used as an index question: “Have you ever actually engaged in non-suicidal self-injury (NSSI; that is, purposely hurt yourself without wanting to die, for example by cutting or

**Table 1**

Frequencies and percentages, means and standard deviations for demographics in adolescents with and without self-injury.

	No self-injury <i>n</i> = 4673–4685*	NSSI <i>n</i> = 923–933*	SASI <i>n</i> = 42–43*	NSSI + SASI <i>n</i> = 81–82*	Statistics Differences between groups NSSI (a), SASI (b) and NSSI + SASI (c)
Sex					a vs. b n.s. b vs. c $\chi^2 = (2) 10.05, p = .007$ , Cramers's V = 0.28 a vs. c $\chi^2 = (2) 15.38, p < .001$ , Cramers's V = 0.12
Male	2301 (49.1)	215 (23.0)	13 (30.2)	7 (8.5)	
Female	2346 (50.1)	707 (75.8)	29 (67.4)	71 (86.6)	
Neither boy nor girl	37 (0.8)	11 (1.2)	1 (2.3)	4 (4.9)	
Age	17.96 (0.62)	17.99 (0.66)	17.95 (0.68)	18.01 (0.69)	n.s.
Parents' education					n.s.
Father university/college	1918 (41.1)	339 (36.5)	17 (39.5)	27 (32.9)	
Mother university/college	2443 (52.3)	485 (52.1)	21 (48.8)	9 (46.3)	
Country of origin					n.s.
Born in Sweden	4271 (91.2)	859 (92.1)	41 (95.3)	73 (89.0)	
Mother born in Sweden	3662 (78.2)	741 (79.4)	37 (86.0)	63 (76.8)	
Father born in Sweden	3654 (81.3)	743 (79.6)	36 (83.7)	63 (76.8)	
Perception of family's economy					n.s.
Fairly/very good†	3820 (81.6)	651 (69.8)	31 (72.1)	52 (63.4)	
Some/serious difficulties†	698 (14.9)	253 (27.1)	12 (27.9)	30 (36.6)	
Living conditions					a vs. b $\chi^2 = (6) 12.57, p = .05$ , Cramers's V = 0.11 b vs. c n.s. a vs. c $\chi^2 = (6) 20.84, p = .002$ , Cramers's V = 0.14
Both parents	2860 (61.1)	504 (54.2)	18 (41.9)	27 (32.9)	
Alternating between parents	565 (12.1)	103 (11.1)	7 (16.3)	9 (11.0)	
One parent	662 (14.1)	134 (14.4)	6 (14.0)	16 (19.5)	
One parent with new partner	293 (6.3)	102 (11.0)	3 (7.0)	12 (14.6)	
At institution/foster care	22 (0.5)	10 (1.1)	2 (4.7)	2 (2.4)	
Sibling or with partner	91 (1.9)	28 (3.0)	1 (2.3)	7 (8.5)	
Alone	190 (4.1)	49 (5.3)	6 (14.0)	9 (11.0)	
Parents' occupation					n.s.
Father working	4144 (82.4)	781 (84.3)	36 (85.7)	70 (86.4)	
Mother working	4080 (87.3)	808 (87.5)	36 (83.7)	67 (82.7)	

Note. NSSI = nonsuicidal self-injury, SASI = sex as self-injury, \*numbers vary due to missing data on some variables, †individuals reporting “don't know” result in percentages not adding up to 100 for the no self-injury and NSSI group.

burning)?” Participants who answered “yes” were included in the study as having experience of NSSI. This procedure does not generally tend to overestimate prevalence rates of NSSI compared to checklist procedures (Zetterqvist et al., 2013). SITBI-SF-SR has previously been used with Swedish adolescents (Zetterqvist et al., 2013).

#### 2.4.2. Sex as self-injury (SASI)

A second index question was created for the purpose of the study regarding the use of sex as a means of self-injury: “Have you ever used sex to purposely hurt yourself?” with “Yes” or “No” as response alternatives.

#### 2.4.3. Physical pain

Experience of physical pain during self-injury was measured using a question from the functional assessment of self mutilation (FASM; Lloyd et al., 1997) by asking “Did you experience pain during this self-harm?” with four response alternatives: severe pain, moderate pain, little pain or no pain. The question was asked for NSSI and SASI separately.

#### 2.4.4. Demographics

Demographic questions were drawn up for the purpose of the study (listed in Table 1). Adolescents self-reported demographic information in fixed answer categories.

#### 2.4.5. Abuse

Sexual abuse was measured using the question: “Have you been exposed to any of the following against your will”, followed by six examples grouped into four categories, see Table 2.

Emotional abuse was measured using the question: “Have you prior to the age of 18 been subjected to any of the following by an adult”, followed by three examples: “been isolated, threatened or been isolated

from friends” (Table 2). Physical abuse was measured with the same wording, followed by eight examples (Table 2). Participants who answered “yes” to any of the questions were considered victims of emotional or physical abuse.

#### 2.4.6. Health-related risk-taking

Health-risk behaviors were measured using questions related to sexual or non-sexual risk-taking. Non-sexual risk-taking was measured with questions about use of alcohol, drugs and contact with health care for an eating disorder or suicide attempt. Sexual risk-taking behaviors were measured using questions about experience of selling sex, age of onset for sexual debut, having had more than 10 sexual partners or if no protection was used during last intercourse.

#### 2.4.7. Psychosocial health

**2.4.7.1. Self-esteem.** The Rosenberg self-esteem scale (Rosenberg, 1989) is an instrument that measures self-esteem using 10 items with four possible answers, ranging from “strongly agree” to “strongly disagree”. The total score varies between 0 and 30, with high scores corresponding to high self-esteem. In the current sample, Cronbach's alpha for the total scale was 0.90.

**2.4.7.2. Parental bonding.** The parental bonding instrument (PBI; Parker, 1990, Parker et al., 1979) is an instrument that measures an individual's perception of parenting styles during childhood. It examines “care” and “overprotection” and includes four subscales, two for mothers and two for fathers. The instrument consists of 25 items, where 12 relate to the subscale “care” and 13 relate to the subscale “overprotection”. The response options are presented on a 4-point scale, from “very like” to “very unlike”. The total score for “care” ranges from 0 to 36 and from 0 to 39 for “overprotection”. PBI has been evaluated as an attachment instrument with strong psychometric

**Table 2**

Frequencies and percentages of lifetime prevalence of emotional, physical and sexual abuse in adolescents with and without self-injury.

	No self-injury <i>n</i> = 4289–4685*	NSSI <i>n</i> = 888–933*	SASI <i>n</i> = 40–43*	NSSI + SASI <i>n</i> = 81–82*	Statistics Differences between groups NSSI (a), SASI (b) and NSSI + SASI (c)
Sexual acts against one's wish					a vs. b $\chi^2 = (3) 48.39, p < .001$ , Cramers's $V = 0.23$ b vs. c n.s. a vs. c $\chi^2 = (3) 83.67, p < .001$ , Cramer's $V = 0.29$
No abuse	3609 (84.1)	555 (62.5)	13 (30.2)	18 (22.2)	
No contact/flashing	209 (4.9)	89 (10.0)	3 (7.0)	7 (8.6)	
Contact	287 (6.7)	138 (15.5)	6 (14.0)	18 (22.2)	
Penetrating	184 (4.3)	106 (11.9)	21 (48.8)	38 (46.9)	
Frequency of sexual acts against one's wish ( <i>n</i> = 664, 327, 30, 63)					a vs. b n.s. b vs. c $\chi^2 = (2) 6.26, p = .04$ , Cramers's $V = 0.26$ a vs. c $\chi^2 = (2) 12.19, p = .002$ , Cramer's $V = 0.18$
1 time	317 (47.7)	136 (41.6)	13 (43.3)	12 (19.0)	
2–5 times	237 (35.7)	124 (37.9)	11 (36.7)	30 (47.6)	
More than 5 times	110 (16.6)	67 (20.5)	6 (20.0)	21 (33.3)	
Emotional abuse from adult before age 18	2508 (53.7)	688 (74.3)	36 (83.7)	73 (89.0)	a vs. b n.s. b vs. c n.s. a vs. c $\chi^2 = (1) 8.05, p = .005$ , phi = 0.09
Physical abuse from adult before age 18	1244 (26.8)	423 (45.8)	21 (52.5)	62 (76.5)	a vs. b n.s. b vs. c $\chi^2 = (1) 6.11, p = .01$ , phi = 0.24 a vs. c $\chi^2 = (1) 27.01, p < .001$ , phi = 0.17

Note. NSSI = nonsuicidal self-injury, SASI = sex as self-injury, No contact/flashing = someone has sexually exposed/flashed themselves to you via the Internet or outside the Internet, Contact abuse = someone has touched your genitals or tried to undress you for sex; you have had to stimulate someone's genitals, Penetrating abuse = vaginal, oral or anal sex, Emotional abuse = been isolated, threatened or been isolated from friends, Physical abuse = been pushed or shaken, has someone thrown something at you, hit you with their hands, kicked, bitten or punched you with their fists, hit you with an object, burnt or scalded you, tried choke/strangle you or attacked you physically in any other way, \*numbers vary due to missing data on some variables.

properties in a review by Ravitz et al. (2010). In the present sample all questions and four subscales were examined. Cronbach's alpha for mother care in the present sample was 0.87, and for father care 0.89. Mother and father overprotection was 0.84, and 0.78, respectively.

**2.4.7.3. Trauma symptoms.** Trauma symptoms were measured using the Trauma Symptom Checklist for Children (TSCC; Briere, 1996). The questionnaire includes 54 questions that can be divided into six subscales: anxiety, depression, post-traumatic stress, sexual concerns, dissociation and anger. Response options are “never”, “sometimes”, “often” and “almost all of the time”. When the instrument was psychometrically evaluated (Briere, 1996), Cronbach's alpha was 0.84 for the full instrument and 0.77–0.89 on the six subcategories. The Swedish translation by Nilsson et al. (2008) was used on the current sample. In the present sample, Cronbach's alpha was 0.95 for the full instrument and 0.79–0.88 for the six subscales. All six subscales were examined in the analysis.

## 2.5. Data analysis

Data were analyzed with descriptive statistics using frequencies, mean values, cross-tabulation with chi-square ( $\chi^2$ ) and *t*-tests. Phi coefficient and Cramers's *V* were calculated for effect size (ES) using Cohen's (1988) criteria of 0.10, 0.30 and 0.50 for small, medium and large effect for Phi and 0.07, 0.21 and 0.35, respectively, for Cramer's *V*. Internal consistency was assessed using Cronbach's alpha ( $\alpha$ ). One-way analysis of variance (ANOVA) was performed for analyses of group differences between the self-injuring groups. The group with no SIB was shown for visual comparison as a reference point in the tables. The ES was calculated for group comparison using eta squared ( $\eta^2$ ) with Cohen's (1988) guidelines for small (0.01), medium (0.06), and large (0.14) effect. Post hoc pairwise analyses were performed using Tukey adjustment for multiple comparisons. The covariance matrix was checked manually to ensure that the assumption of equality of covariance was met. All statistical analyses were performed using the SPSS

23.0 software package (SPSS Inc, Chicago, IL).

## 3. Results

### 3.1. Self-Injury status

Of the whole sample (*n* = 5743), 1015 (17.7%) adolescents confirmed presence of lifetime NSSI. In addition, 125 (2.2%) adolescents reported having used sex as a means of self-injury, with or without co-occurring NSSI. For the present analysis, adolescents who confirmed one or both types of these two self-injurious behaviors (*n* = 1058) were classified into the following groups: adolescents with NSSI only (*n* = 933), those with SASI only (*n* = 43) and those who reported both NSSI and SASI (*n* = 82). Of the total number of adolescents, 4685 (81.6%) did not report any SIB. Among adolescents with no SIB the proportion of boys and girls was similar (49.1% vs. 50.1%), whereas more girls than boys engaged in NSSI (75.8% vs. 23.0%), SASI (67.4% vs. 30.2%) or both (86.6% vs. 8.5%). The percentages do not add up to 100%, since some adolescents reported being neither boy nor girl. There were no significant differences between adolescents with SASI only and NSSI only regarding demographics. There was a trend ( $p = .05$ ) that fewer adolescents with SASI lived with both parents. There were, however, some differences in background variables for the group with both NSSI and SASI compared to those with only one type of self-injury, i.e., the multiple group consisted of significantly fewer males compared to NSSI only and SASI only ( $p < .001$ , and  $p = .007$ , respectively). Furthermore, significantly fewer adolescents with NSSI + SASI lived with both parents and more lived alone compared to those with NSSI only ( $p = .002$ ). Demographics for the three self-injurious groups and for adolescents without SIB are presented in Table 1.

### 3.2. Sex as self-injury vs. NSSI

Regarding self-reported prevalence of emotional, physical and/or sexual abuse, significantly more adolescents ( $p < .001$ ) with SASI



**Table 3**

Frequencies and percentages, means and standard deviations of health-related risk behaviors in adolescents with and without self-injury.

	No self-injury <i>n</i> = 2902–4685*	NSSI <i>n</i> = 716–933*	SASI <i>n</i> = 40–43*	NSSI + SASI <i>n</i> = 77–82*	Statistics Differences between groups NSSI (a), SASI (b) and NSSI + SASI (c)
<b>Sexually related</b>					
Having sold sex	28 (0.6)	9 (1.0)	3 (7.1)	11 (13.4)	a vs. b $\chi^2 = (1) 8.04, p = .005, \phi = 0.11$ b vs. c n.s.
Age of onset for sexual debut	15.59 (1.56)	15.38 (1.60)	14.78 (1.44)	14.53 (1.76)	a vs. c $\chi^2 = (1) 54.14, p < .001, \phi = 0.24$ a vs. b n.s. b vs. c n.s.
> 10 sexual partners	285 (9.7)	92 (12.7)	14 (35.0)	27 (34.2)	a vs. c $t = 4.44 (793), p < .001$ a vs. b $\chi^2 = (3) 17.90, p < .001, \text{Cramer's } V = 0.11$ b vs. c n.s.
Did not use protection during last intercourse	910 (31.1)	249 (34.5)	17 (41.5)	33 (41.8)	a vs. c $\chi^2 = (3) 34.42, p < .001, \text{Cramer's } V = 0.11$ a vs. b n.s. b vs. c n.s. a vs. c n.s.
<b>Other</b>					
Alcohol use	1580 (33.8)	328 (35.2)	19 (44.2)	39 (48.1)	a vs. b n.s. b vs. c n.s.
Drug use	897 (19.5)	271 (29.6)	19 (45.2)	38 (48.1)	a vs. c $\chi^2 = (1) 4.90, p = .03, \phi = 0.07$ a vs. b $\chi^2 = (1) 3.95, p = .047, \phi = 0.07$ b vs. c n.s.
Ever been in contact with health care for eating disorder	163 (3.6)	125 (13.9)	6 (14.6)	28 (36.4)	a vs. c $\chi^2 = (1) 10.80, p < .001, \phi = 0.11$ a vs. b n.s.
Ever been in contact with health care for suicide attempt	66 (1.5)	125 (13.8)	3 (7.0)	35 (44.9)	b vs. c $\chi^2 = (1) 5.15, p = .02, \phi = 0.23$ a vs. c $\chi^2 = (1) 25.39, p < .001, \phi = 0.17$ a vs. b n.s. b vs. c $\chi^2 = (1) 16.76, p < .001, \phi = 0.39$ a vs. c $\chi^2 = (1) 48.80, p < .001, \phi = 0.23$

Note. NSSI = nonsuicidal self-injury, SASI = sex as self-injury, alcohol use = during the last 12 months consumed 1 bottle of wine or equivalent 2–3 times/month or more often, drug use = confirmed having tried drugs at least once during lifetime. \*Numbers vary due to missing data on some variables.

(48.8%) reported having been exposed to penetrating sexual abuse against their will, compared to adolescents who reported NSSI only (11.9%). There were no differences between these groups regarding non-penetrating types of sexual abuse, such as flashing or other contact/touching. Furthermore, reported experience of emotional or physical abuse did not differentiate between adolescents with NSSI only or SASI only (Table 2). Mean age at time of first sexual abuse in the SASI group was 13.82 years ( $SD = 2.81$ ). Mean age of onset of using sex as self-injury among adolescents in the SASI group with experience of sexual abuse was 15.40 years ( $SD = 1.81$ ). The mean age of first sexual abuse was significantly lower than the mean age of SASI onset.

With regard to sexual risk-taking behaviors, there were further differences between groups (Table 3). Significantly more adolescents ( $p = .005$ ) with SASI only (7.1%) had sold sex compared to those reporting NSSI only (1.0%), but these results need to be interpreted with caution due to very low frequency of this behavior in the SASI group ( $n = 3$ ). Significantly more adolescents ( $p < .001$ ) with SASI also reported more than 10 sexual partners (35.0% vs. 12.7%). Age of onset for sexual debut did not differ between those with NSSI and SASI, and equally many reported having used protection during last intercourse. Other health-related risk behaviors such as drug use was more common ( $p = .047$ ) among adolescents with SASI only (45.2% vs. 29.6%), but there was no difference in alcohol consumption compared to those with NSSI only. Self-reported contact with health care for an eating disorder (13.9% vs. 14.6%) or suicide attempt (13.8% vs. 7.0%) did not differ between NSSI and SASI groups (Table 3).

When the two groups were compared on trauma symptoms (Table 4), adolescents with SASI only reported significantly higher levels of sexual concerns (both sexual preoccupation and sexual distress) compared to adolescents with NSSI only ( $p < .001$ ). There was also a trend towards higher levels of symptoms of posttraumatic stress ( $p = .07$ ) and dissociation ( $p = .047$ ) in the SASI group compared to the NSSI group. Other trauma symptoms, such as symptoms of depression, anxiety and anger did not, however, differentiate between those with SASI and those with NSSI. Similarly, there were no significant

differences between groups on self-reported levels of self-esteem or parental care or overprotection. The groups did not differ significantly with regard to experience of pain when engaging in NSSI or SASI. For those with NSSI, 38.3% reported moderate to sharp pain, compared to 35.4% of those engaging in SASI.

### 3.3. Adolescents engaging in both NSSI and SASI

Significantly more adolescents ( $p < .001$ ) who engaged in both NSSI and SASI (46.9%) had been exposed to penetrating sexual abuse compared to those with NSSI only (11.9%), whereas the difference was negligible compared to those with SASI only (48.8%). Those with both NSSI and SASI had been exposed to more frequent sexual abuse than those with SASI only ( $p = .04$ ), where 47.6% reported a frequency of 2–5 times and 33.3% reported more than five times, compared to 36.7% and 20.0%, respectively, of adolescents with SASI only (Table 2). Significantly more adolescents in the NSSI + SASI group (76.5%) also had experience of physical abuse compared to those with NSSI only (45.8%,  $p < .001$ ) or SASI only (52.5%,  $p = .01$ ). Emotional abuse was also significantly ( $p = .005$ ) more commonly reported among those with both types of behavior (89.0%) compared to those with NSSI only (74.3%), but was almost as common among those with SASI only (83.7%). See Table 2.

Furthermore, significantly more adolescents ( $p < .001$ ) who reported NSSI + SASI (13.4%) had sold sex compared to those with NSSI only (1.0%), but did not differ significantly from those with SASI only (7.1%). The number reporting more than 10 sexual partners in the NSSI + SASI group (34.2%) were similar to those with SASI only (35.0%), but significantly more ( $p < .001$ ) than those with NSSI only (12.7%). The groups did not differ regarding age of onset for sexual debut. Significantly more adolescents in the NSSI + SASI group had been in contact with health care for an eating disorder (36.4%) or suicide attempt (44.9%) compared to adolescents with SASI only (14.6%,  $p = .02$  and 7.0%,  $p < .001$ ) or NSSI only (13.9%,  $p < .001$  and 13.8%,  $p < .001$ ). Significantly more adolescents ( $p < .001$ ) in the

**Table 4**

Means and standard deviations for self-reported self-esteem, parental care and overprotection and trauma symptoms in adolescents with and without self-injury .

	No self-injury <i>n</i> = 4518–4663*	NSSI <i>n</i> = 905–931*	SASI <i>n</i> = 41–43*	NSSI + SASI <i>n</i> = 81–82*	Statistics Differences between groups NSSI (a), SASI (b) and NSSI + SASI (c)
Rosenberg self-esteem	22.13 (6.01)	16.61 (7.26)	17.16 (5.91)	12.35 (7.89)	$F(2, 1053) = 13.29, p < .001, \eta^2 = 0.02$ a vs. b n.s.; b vs. c $p = .001$ ; a vs. c $p < .001$
PBI care mothers	30.53 (5.84)	27.90 (7.50)	27.02 (8.11)	25.41 (8.24)	$F(2, 1049) = 4.20, p = .02, \eta^2 = 0.008$ a vs. b n.s.; b vs. c n.s.; a vs. c $p = .01$
PBI care fathers	28.61 (6.98)	24.86 (8.33)	25.30 (7.55)	19.34 (8.84)	$F(2, 1028) = 16.35, p < .001, \eta^2 = 0.03$ a vs. b n.s.; b vs. c $p < .001$ ; a vs. c $p < .001$
PBI overprotection mothers	11.33 (6.59)	13.27 (7.62)	14.00 (7.60)	15.17 (7.28)	$F(2, 1049) = 2.46, p = .09, \eta^2 = 0.005$ a vs. b n.s.; b vs. c n.s.; a vs. c $p = .09$
PBI overprotection fathers	10.30 (6.46)	11.96 (7.20)	11.42 (6.40)	14.24 (7.77)	$F(2, 1025) = 3.86, p = .02, \eta^2 = 0.007$ a vs. b n.s.; b vs. c n.s.; a vs. c $p = .02$
TSCC Depression	4.19 (3.67)	9.10 (5.29)	9.07 (4.29)	14.02 (6.31)	$F(2, 1046) = 32.24, p < .001, \eta^2 = 0.06$ a vs. b n.s.; b vs. c $p < .001$ ; a vs. c $p < .001$
TSCC anxiety	4.07 (3.56)	7.21 (4.42)	8.38 (4.44)	10.28 (5.95)	$F(2, 1046) = 17.87, p < .001, \eta^2 = 0.03$ a vs. b n.s.; b vs. c $p = .07$ ; a vs. c $p < .001$
TSCC anger	3.54 (3.64)	6.50 (4.71)	7.29 (4.74)	9.84 (6.04)	$F(2, 1046) = 18.24, p < .001, \eta^2 = 0.03$ a vs. b n.s.; b vs. c $p = .02$ ; a vs. c $p < .001$
TSCC posttraumatic stress	5.33 (4.45)	9.69 (5.58)	11.69 (5.44)	15.25 (6.52)	$F(2, 1044) = 37.45, p < .001, \eta^2 = 0.07$ a vs. b = 0.07; b vs. c $p = .003$ ; a vs. c $p < .001$
TSCC dissociation	5.18 (4.30)	9.23 (5.41)	11.29 (5.27)	13.72 (6.53)	$F(2, 1046) = 26.98, p < .001, \eta^2 = 0.05$ a vs. b = 0.047; b vs. c $p = .05$ ; a vs. c $p < .001$
TSCC sexual concerns	2.06 (2.40)	2.83 (2.58)	4.79 (3.72)	4.83 (4.02)	$F(2, 1046) = 27.74, p < .001, \eta^2 = 0.05$ a vs. b $p < .001$ ; b vs. c n.s.; a vs. c $p < .001$
TSCC preoccupation	4.07 (3.59)	4.99 (3.81)	7.60 (4.62)	6.73 (5.07)	$F(2, 1046) = 15.19, p < .001, \eta^2 = 0.03$ a vs. b $p < .001$ ; b vs. c n.s.; a vs. c $p < .001$
TSCC distress	3.26 (2.68)	4.44 (2.88)	6.63 (3.41)	7.05 (4.32)	$F(2, 1041) = 36.14, p < .001, \eta^2 = 0.06$ a vs. b $p < .001$ ; b vs. c n.s.; a vs. c $p < .001$

Note. PBI = parental bonding instrument, NSSI = nonsuicidal self-injury, SASI = sex as self-injury, TSCC = trauma symptom checklist for children, One-way analysis of variance with pairwise post hoc was performed on the self-injuring groups only using Tukey corrections for multiple comparisons, \*numbers vary due to missing data on some variables.

NSSI + SASI group reported prevalent drug use compared to the NSSI only group (48.1% vs. 29.6%). Similarly, more adolescents ( $p = .03$ ) with both NSSI + SASI reported frequent alcohol consumption compared to those with NSSI only (48.1% vs. 35.2%). See Table 3.

The NSSI + SASI group reported significantly higher levels on all trauma symptom subscales ( $p < .001$ ) and lower levels of self-reported self-esteem ( $p < .001$ ) and parental care ( $p = .01$ ;  $p < .001$ ) compared to those with NSSI only (Table 4), and significantly higher levels of depression ( $p < .001$ ), anger ( $p = .02$ ) and posttraumatic stress ( $p = .003$ ) and significantly lower levels of self-esteem ( $p = .001$ ) and paternal care ( $p < .001$ ) than those with SASI only (Table 4). There were no significant differences on the sexual concerns subscales (pre-occupation and distress) in the NSSI + SASI group compared to the SASI only group. Adolescents with both NSSI and SASI reported no statistically significant difference in regard to pain for respective behavior: 64.6% reported moderate to sharp pain when engaging in SASI compared to 52.4% for NSSI (Table 4).

#### 4. Discussion

This study focuses on a conceptually unexplored behavior where adolescents report deliberately using sex as a self-injurious behavior. Adolescents who reported having used SASI only were compared to adolescents with direct NSSI only and also to those who reported having engaged in both NSSI and SASI. Associations with health-related risk behaviors, experience of abuse (physical, emotional and/or sexual), as well as psychosocial health were examined in order to contribute information as to how the behavior of using sex as self-injury should be understood.

Of the present sample of 5743 Swedish high school adolescents, 17.7% endorsed the general NSSI question from SITBI-SF-SR (Nock et al., 2007). Almost the same prevalence rate of NSSI (17.2%) was found in a previous study of 3060 high school adolescents in other parts of Sweden (M. Zetterqvist et al., 2013). The 125 (2.2%)

adolescents who reported experience of SASI should be considered a preliminary estimation of the prevalence of this behavior in a high school sample in Sweden (Fredlund et al., 2017).

There is an ongoing discussion on how more indirect behaviors, where people abuse and mistreat themselves, are related to direct forms of self-injury (Hooley and St. Germain, 2014). Important steps in the conceptualization of different self-injurious behaviors would be to examine whether they can be considered to be distinct or alternate forms, and furthermore if one form is more severe on relevant clinical measures than the other (Hooley and St. Germain, 2014). As an example of severity, an earlier study on direct and indirect forms of self-injury found that suicide proneness was more often associated with NSSI than with indirect forms (St. Germain and Hooley, 2012).

##### 4.1. Sex as self-injury compared to direct nonsuicidal self-injury

Our data showed a specific association between penetrating sexual abuse and SASI, in that more adolescents who had engaged in SASI had experience of penetrating sexual abuse compared to the NSSI only group, as well as of sexual risk-taking behavior, such as having had more sexual partners. More adolescents in the SASI group also had experience of selling sex, although frequency of this behavior was low, which makes it difficult to draw any conclusions. Our data consequently lend some preliminary support to the distinct condition model, suggested by Hooley and St. Germain (2014). The distinct relationship between penetrating sexual abuse and SASI was further confirmed by higher levels of specific trauma symptoms (dissociation, posttraumatic stress and sexual concerns), but not of other symptoms (such as depression, anxiety, anger) in the SASI only group compared to those with NSSI only. The SASI group thus seems to represent a distinctly more sexually traumatized population, with experiences of penetrating sexual abuse and trauma symptoms. Although the design of the study was cross-sectional, which means that causal relationships cannot be presented, self-reported age indicated that the experience of sexual

abuse preceded the behavior of using sex as a form of self-injury for adolescents in the SASI group.

Our data suggests that SASI could potentially be conceptualized in the context of reenactment (Fredlund et al., 2017; van der Kolk, 1989), as revictimization, and also potentially as a specific form of (indirect) self-injury, where sex is used as means of coping with experiences of penetrating sexual abuse and symptoms of traumatic stress. Briere et al. (2010) describe that the dysfunctional sexual activity can function as an avoidant, tension-reducing behavior. An earlier study also showed high endorsement of self-punishment as a reason for SASI behavior (Jonsson et al., 2017). In trauma theory, self-injury is seen as one type of behavioral reenactment of child sexual abuse (Penning and Collings, 2014; van der Kolk, 1989), as is revictimization. Psychological distress and sexual risk-taking behaviors following victimization have also been shown to predict revictimization (Cuevas et al., 2010; Messman-Moore et al., 2010). Reiker and Carmen (1986) describe how victims of abuse try to replace feelings of helplessness with an illusion of control. The compulsion to repeat trauma in victims of abuse has been studied in the context of trauma theory, as well as anger directed toward oneself (van der Kolk, 1989). Yet another piece of the puzzle might be found in social psychology and the theory of self-verification, which postulates that people prefer evaluations of themselves made by others that are consistent with their own views of themselves. People with a negative self-concept thus tend to seek, and even prefer, interactions with people who treat them negatively (Swann, 1992). An earlier study showed that victims of sexual abuse demonstrated less body maintenance and protection, exposed themselves to danger and took less care of themselves compared to those with experience of physical abuse (Kremer et al., 2013), which is in line with our results that showed that it was not uncommon for adolescents who engaged in SASI to have sold sex and to have had more than 10 sexual partners, as well as reporting drug use.

Some of the measures, however, did not distinguish between adolescents engaging in NSSI only and those engaging in SASI only, which also needs to be highlighted. There were no differences between those with SASI or NSSI with regard to self-reported experiences of emotional and physical abuse. Nor did symptoms of depression, anxiety and anger, or measures of self-esteem or attachment, differentiate the NSSI group from the SASI group. Interestingly enough, this is also consistent with an earlier study by St. Germain and Hooley (2012), who did not find any significant difference on measures of aggression, self-esteem and depressive symptoms between direct and indirect forms of self-injury, suggesting some overlapping psychological characteristics. With regard to severity, St. Germain and Hooley (2012) found that those with direct self-injury, such as NSSI, were more suicidal than those with indirect self-injury and controls. There was, however, no statistical difference between NSSI only and SASI only in our sample concerning health care contact due to a suicide attempt. The actual number of adolescents with SASI who had been in contact with health care for a suicide attempt was only three, which in all likelihood indicates that the sample size was underpowered, with less chance of detecting potential differences between groups on this item. Measure of contact with health care probably underestimates suicide attempts among adolescents. The question of severity is therefore not easily answered in this study.

#### 4.2. Several forms of self-injury compared to single forms

Adolescents with both types of SIB stood out as the most severely burdened and distressed group, which is in line with earlier research on multiple forms of self-injurious behavior (Zetterqvist et al., 2013). Lower self-esteem and paternal care, as well as higher levels of trauma symptoms of depression, anxiety, anger, dissociation and posttraumatic stress characterized this group, as did experiences of frequent sexual and physical abuse and contact with health care for an eating disorder or suicide attempt.

#### 4.3. Conclusion

There was a distinct and specific association between penetrating sexual abuse, sexual risk-taking behaviors, trauma symptoms of dissociation, posttraumatic stress and sexual concerns and using sex as self-injury. This potentially emphasizes the distinct function of handling distress associated with sexual abuse through sexual relations, using sex as a means of self-injury in a more indirect manner. There were also variables where the SIB could potentially be seen as an alternative form, i.e., either type of direct or indirect self-injurious behavior could be used to modify affective or social experiences and cause bodily harm when in distress. Finally, adolescents with both types of SIB (NSSI + SASI) stood out as the most burdened group, which potentially explains their need for multiple forms of self-injury to cope with distress. Whether the sexual behavior described in this article is best conceptualized as self-injury still needs further study. Our data, however, contribute yet another piece to the puzzle of understanding the circumstances of why people hurt themselves.

#### 4.4. Limitations

Since the present study was based on cross-sectional data, causal relationships cannot be presented. Age of onset for both SASI and sexual abuse was reported in the study, with results showing that sexual abuse preceded SASI. With the lack of longitudinal data there is, however, always a potential for recall bias in retrospective self-report studies.

A standardized measure of suicidality was also lacking in the study. In measuring those who have been in contact with health care for a suicide attempt, several acts with suicidal intent that did not come to the attention of health care may have been missed, and thus the actual frequency may be underestimated.

The measure of SASI itself has some limitations. The question that assessed sex as self-injury was based on clinical experience and results from qualitative interviews (Jonsson and Lundström Mattsson, 2012). The single item used lacked additional probing to determine what behaviors respondents might be referring to when endorsing this item, nor did it allow them to describe the behavior further. It would have been conceptually interesting to have a fuller description and examples from respondents. Furthermore, a clearer description of participants' state of mind before engaging in SASI, to ascertain which affective/cognitive or social experiences they were attempting to modify when engaging in the self-injurious behavior (Nock, 2010), would have added valuable information. From our data we cannot assess if the behavior aimed at reenacting an earlier sexual abuse, making oneself vulnerable to physical pain or perhaps psychological humiliation, to mention a few examples. Single item measures might also lead to a conceptual overlap of areas of interest, such as SASI and, for example, sexual abuse. Future qualitative studies are needed to explore further this preliminary work on the subject.

Finally, the participation rate of the study, 59.7% of the eligible adolescents, could be considered low, but is on a par with 60.4% in the previous study from 2009 (Svedin and Priebe, 2009). Approximately 10% is explained by students who were absent on a regular school day. The rest of the missing answers could be due to a lack of motivation to participate, a feeling of discomfort when filling in the questionnaire or not having the attention span needed to answer all the questions. Adolescents that did not answer the questionnaire might therefore potentially be a more exposed group, which could mean that our findings are somewhat misrepresentative and are more likely to be underestimated than over-exaggerated.

#### 4.5. Clinical implications

Two-thirds of the adolescents in this study who had engaged in SASI also reported experience of NSSI. Different forms of self-injury thus tend to co-occur. The implication of this for clinical practice is that it is

important to assess for a wide range of self-injurious behaviors, both indirect and direct, when the presence of one type has been identified. These behaviors are often perceived as stigmatizing and kept secret from others, and therefore information about their existence might not spontaneously be shared if the issue is not approached directly by clinicians in a respectful manner. Based on the results in the present study, adolescents who are identified as engaging in SASI need to be screened for sexual abuse history and vice versa, as well as for trauma symptoms. Appropriate trauma-focused treatments should be offered when needed. Suitable skills for emotion regulation and communication should also be addressed, and such strategies can thus be targeted in treatment, hopefully increasing the use of emotion regulating skills that make it possible to replace self-injury with functionally equivalent behaviors in the context of a helping environment.

### Conflict of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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