

Parental attachment and childhood trauma in adolescents engaged in non-suicidal self-injury

Kayhan Bahali¹  | Gizem Durcan²  | Melike Topal³  | Bedia Sultan Önal⁴  |
Ayhan Bilgiç⁵  | Canan Tanıdır¹  | Tuğçe Aytemiz⁶  | Yankı Yazgan^{7,8}

¹Department of Psychology, Istanbul Gelisim University, Istanbul, Turkey

²Department of Child and Adolescent Psychiatry, Medical Faculty of Cerrahpasa, Istanbul University-Cerrahpasa, Istanbul, Turkey

³Department of Child and Adolescent Psychiatry, University of Health Sciences, Basaksehir Cam ve Sakura Research and Training Hospital, Istanbul, Turkey

⁴Department of Child and Adolescent Psychiatry, Medical Faculty, Giresun University, Giresun, Turkey

⁵Faculty of Medicine, Izmir University of Economics, Izmir, Turkey

⁶Child and Adolescent Psychology Laboratory, University of Health Sciences, Bakirkoy Research and Training Hospital for Psychiatry, Neurology and Neurosurgery, Istanbul, Turkey

⁷Department of Child and Adolescent Psychiatry, Güzel Günler Clinic, Istanbul, Turkey

⁸Child Study Center, Yale University School of Medicine, New Haven, Connecticut, USA

Correspondence

Gizem Durcan, Department of Child and Adolescent Psychiatry, Medical Faculty of Cerrahpasa, Istanbul University-Cerrahpasa, Istanbul, Turkey.

Email: drgezemkaymak@hotmail.com

Abstract

Aim: In this study, it was aimed to compare parental attachment and childhood traumas in adolescents with NSSI with healthy peers.

Methods: Fifty adolescents aged 14–18 years with lifetime NSSI and 56 healthy peers were included in the study. Inventory of Statements About Self-injury (ISAS), The Parental Bonding Instrument (PBI) and Child Trauma Questionnaire (CTQ-28) scales were used.

Results: Eighty-two percentage of the NSSI group and 70% of the control group were girls. The mean age was 15.6 ± 1.1 years in the NSSI group and 15.3 ± 0.9 years in the control group. There was no significant difference between the groups in terms of age and gender. The NSSI group had more negative scores than the control group in terms of childhood traumas and attachment characteristics to both mother and father. The analyses showed that mother PBI care/control and sexual abuse score had a relationship with both ISAS Autonomic Functions and ISAS Social Functions scores.

Conclusions: These results suggest that secure attachment with the mother may be protective for both the autonomic and social functions of the NSSI. Therefore, interventions for dysfunctional parental attachment may prevent the development of NSSI.

KEYWORDS

adolescent, adverse childhood experiences, parental attachment, self-injurious behaviour

1 | INTRODUCTION

Non-suicidal self-injury (NSSI) is one of the growing public health problems. It is defined as a spectrum of deliberate self-directed injury to one's body that does not involve suicidal intent, excludes socially sanctioned behaviours such as piercing, tattooing, and body modification practices, and results in mild-to-moderate physical harm (Nock & Favazza, 2009). NSSI includes a variety of acts like skin-cutting,

hitting, biting, burning, scratching, carving, banging, and scraping (Zetterqvist, 2015). The lifetime prevalence of NSSI varies ranging from 9% to 36% among adolescents (Gholamrezaei et al., 2017; Mannekote Thippaiah et al., 2021). It typically begins in early to middle adolescence and is a common behaviour among adolescents and young adults (Brown & Plener, 2017). Understanding the etiological factors that lead to NSSI is of paramount importance. The literature has identified several risk factors such as previous attempt of

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2023 The Authors. *Early Intervention in Psychiatry* published by John Wiley & Sons Australia, Ltd.

self-injury, familial factors such as history of suicide and suicidal behaviour, executive functioning dysfunctions and decision-making dysfunctions, childhood abuse and neglect, suicidal ideation, hopelessness, negative temperament traits, cluster B personality disorders, and media influences (Mummé et al., 2017). Adolescents who engage in NSSI have been reported to have higher rates of negative outcomes, including psychopathology and suicide (Taylor et al., 2018). In recent years, there has been increasing evidence of immune-inflammatory abnormalities in suicidal ideation and behaviour (Serafini et al., 2020). Similarly, childhood trauma has also been shown to lead to inflammatory abnormalities in later life (Brown et al., 2021). Inflammatory processes may also play a role in adverse clinical outcomes of NSSI such as suicidal behaviour. Studies to understand suicide, perhaps the most important negative outcome of NSSI, have investigated the role of the opioid system and have shown that buprenorphine is effective and safe in reducing suicidal thoughts and NSSI (Serafini et al., 2018). An understanding of NSSI phenomenon and its aetiology will allow clinicians to intervene effectively with adolescents who engage in NSSI and prevent suicidal behaviours.

Clinical studies have discussed multiple associated factors of NSSI include psychological characteristics (such as negative emotionality, deficit in emotion skills, self-derogation), psychiatric disorders, childhood environmental factors and adversities (Klonsky, 2007). Considering psychological factors, the studies have found that early-life traumatic events can influence on need to engage self-injury via managing stress abilities and emotion regulation (Lovell & Clifford, 2016). A systematic review has shown that childhood maltreatment is a significant risk factor for NSSI (Serafini et al., 2017).

Considering Bowlby's Attachment Theory, one of the most important characteristics attributed to psychological well-being is a secure parental attachment (Braga & Gonçalves, 2014). While maternal attachment is related to providing care, comfort, reassurance and a secure base to explore; Attachment to father is more effective than mother in encouraging risk-taking in play, exploration and approach of new social situations, which helps to develop children's confidence and self-esteem (Paquette & Bigras, 2010). Evidence suggests that attachment problems play a fundamental role in NSSI (Molaie et al., 2019) and published studies have yielded that insecure attachment is a risk factor for NSSI (Cassels et al., 2019).

Infants and young children with secure attachments are characterized by higher self-reliance, emotional regulation, social competency, and positive mental health. On the other hand, neglect and maltreatment evokes insecure attachments in infants and children (Gandhi et al., 2016). The present study aimed to evaluate the relationship between NSSI, childhood trauma and attachment to parents. Since most studies examining the related factors with adolescent NSSI in the field were conducted with outpatients, the initial purpose of this study was to evaluate self-injuring behaviours in inpatients. For this purpose, we conducted two groups, based on the history of lifetime self-injury, inpatient adolescents with NSSI (with/without suicide attempt) and a control group. Despite an abundance of studies regarding attachment explanatory model, few empirical studies have examined the

relationship between adolescent's attachment to father and NSSI (Jiang et al., 2017). Although studies on the relationship between NSSI and attachment have been conducted in the literature, mostly only attachment to the mother has been evaluated, the evaluation of attachment with both mother and father in this study will contribute to the literature. In addition, the current study investigated the relationship between different types of childhood traumas and NSSI. We hypothesized that; (1) adolescents with NSSI will have less positive parental attachment to both parents, (2) history of childhood traumas will be more common among NSSI group compared to non-NSSI group.

2 | METHOD

2.1 | Study groups

This case-control study was conducted in the inpatient clinic of Bakirkoy Prof. Dr. Mazhar Osman Training and Research Hospital for Psychiatry and Neurology, Department of Child and Adolescent Psychiatry. This service is closed and admits patients with indications such as suicide risk, homicide risk, acute psychotic and manic attacks, and treatment refusal. First of all, the participants were explained what NSSI is and what behaviours it covers. Next, NSSI methods in Inventory of Statements About Self-injury (skin cutting, followed by head banging or hitting, preventing healing, scraping the skin, drinking hazardous substances, burning the skin, hair plucking, clawing, pricking, biting, and pinching) were asked if they had ever done each of them in their lifetime. Fifty adolescents with lifetime NSSI, aged 14 to 18, were included in the study. Patients who were illiterate or diagnosed with mental retardation, acute psychosis, bipolar disorder, manic episode or autism were excluded from the study. The control group was composed of healthy children from the local community. For the control group, the ones who reported any NSSI behaviours on the Inventory of Statements About Self-injury (ISAS) Scale and who reported to have applied for psychiatric help previously were excluded. Of the 86 adolescents included in the study for control group, 23 were excluded from the study because they reported NSSI and 7 were excluded because they had previously applied for psychiatric help. Statistical analysis was made with 50 patients with NSSI and 56 healthy controls.

2.2 | Study procedures

All participants were informed of the study protocol and those who volunteered to participate were included in the study. A standard form was used to collect demographic data (age, sex, the education level of the child, parental age and education status). How to fill in the forms was explained by the researchers to the adolescents who independently completed the questionnaires in a silent room. The study protocol was reviewed and approved by the institutional ethical committee.

2.3 | Measures

2.3.1 | Inventory of statements about self-injury (ISAS)

ISAS is a two-section scale developed by Klonsky and Glenn (2009). The first section (behaviours) evaluates the lifetime frequency of 12 NSSI behaviours that is intentional and not suicidal. In this section, participants are asked how many times they perform each behaviour. Those endorsing one or more NSSI behaviours are directed to answer the second section of the scale. The second section assesses 13 potential functions of NSSI. The functions have two dimensions as autonomic functions and social functions. Autonomic functions include 5 subscales: affect regulation, anti-suicide, marking distress, self-punishment, and anti-dissociation. Social functions have 8 subscales: interpersonal boundaries, interpersonal influence, revenge, sensation seeking, peer bonding, toughness, autonomy, self-care (Klonsky & Glenn, 2009). Turkish validity and reliability of the scale has been made by Bildik et al. (2012).

2.3.2 | The parental bonding instrument (PBI)

The PBI was developed by Parker et al. to retrospectively evaluates the relationship pattern established with the parents in terms of the individual's perception (Parker et al., 1979). It is filled in separately for the mother and father. The scale has two subscales: care and control/overprotection. In the original form of the scale, an increase in the care dimension and a decrease in the overprotection/control dimension indicate perceived positive parental behaviours. However, in the Turkish validity and reliability study, all items were arranged in the same direction in terms of meaning—the score increase reflects positive parental attachment. Therefore, an increase in both subscales in the Turkish form indicates positive attachment (Kapçı & Küçüker, 2006). In the Turkish validity and reliability study, similar to its original form, a two-factor structure was determined, but it was divided into care/control and overprotection (Kapçı & Küçüker, 2006).

2.3.3 | Child trauma questionnaire (CTQ-28)

The CTQ was developed by Bernstein and Fink to evaluate the history of trauma in adolescents with psychiatric disorders (Bernstein et al., 1994). It is a self-report tool designed to assess five types of childhood trauma: emotional abuse, emotional neglect, physical abuse, physical neglect, and sexual abuse. The higher score indicating higher abuse and neglect experiences (Bernstein et al., 1994; Şar et al., 2012). Turkish validity and reliability of the scale has been made by Şar et al. (2012).

2.4 | Statistical analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) software. Descriptive statistical methods

(Frequency, Percentage, Mean, Standard deviation) were examined and Kolmogorov–Smirnov distribution test was used to examine the normal distribution. Categorical variables were compared using Pearson's Chi-square test. Since the data did not show normal distribution, the Mann–Whitney *U* test were used for group comparisons and Spearman's correlation analysis for intercorrelations between continuous parameters. Linear regression analyses (forward conditional model) were performed to evaluate the effects of childhood trauma and parental bonding related to NSSI social and autonomic functions in the patient group. The results with reliabilities of .95 or greater were interpreted and *p*-values <.05 were considered as significant. However, to take into account the risk of type I error due to a multiple testing effect, *p* values were adjusted by the Benjamini-Hochberg procedure with .05 false discovery rate for correlation analyses.

3 | RESULTS

The study included 50 adolescents with lifetime NSSI (9 boys, 41 girls) and 56 healthy adolescents (19 boys, 37 girls) as a control group ($\chi^2 = 3.45$, $p = .063$). The mean age did not differ significantly between the patient (15.6 ± 1.1 years) and control (15.3 ± 0.9 years) groups (range, 14–18 years; $z = 1.72$, $p = .086$). The mean age of onset of NSSI was 12.9 ± 2.6 years in the patient group. Approximately half of the patient group (44%) had more than one psychiatric diagnosis. The most common diagnoses were depression in 20 patients (40%), conduct disorder in 16 (32%), substance abuse in 14 (28%), and PTSD in 6 (12%). The most frequent NSSI way was skin cutting (82%), followed by head banging or hitting (48%), preventing wound healing (46%), scraping the skin (44%), drinking hazardous substances (42%), burning the skin (30%), hair plucking (26%), clawing (20%), pricking (10%), biting (6%) and pinching (4%).

All of the mean CTQ-28 subscales scores were significantly higher for patients than for controls. Both the mean mother- and father-rated PBI care/control and PBI overprotection scores were significantly lower in the patient group compared to controls. Questionnaire and inventory scores of the adolescents with NSSI and the controls are summarized in Table 1.

The correlations of the ISAS scores with the CTQ-28 and PBI scores in adolescents with NSSI were evaluated in the patient group. Correlations among psychometric questionnaires was given in Table 2.

In the patient group, the frequency of having a history of suicide attempt was 62%. The association between having a history of suicide attempt and questionnaire and inventory scores was also assessed in the patient group. Analyses showed that ISAS Interpersonal Boundaries ($z = 2.18$, $p = .030$), ISAS Sensation Seeking ($z = 2.43$, $p = .015$) and CTQ-28 Emotional Neglect ($z = 2.22$, $p = .026$) scores were higher in the suicide attempters compared to non-attempters. Among the parental bonding subscales, the scores of those who attempted suicide only in the mother care/control subscale were significantly lower than those who did not ($z = -2.40$, $p = .016$). In terms of other scale scores, there was no difference between those who attempted suicide and those who did not.

	Patients (N = 50)	Controls (N = 56)	z	p
CTQ-28				
Emotional abuse	11.6 ± 5.1	6.5 ± 3.0	6.12	<.001
Emotional neglect	13.5 ± 5.3	8.9 ± 3.3	4.60	<.001
Physical abuse	8.4 ± 4.3	5.1 ± 0.4	5.85	<.001
Physical neglect	8.7 ± 3.0	6.1 ± 1.3	4.84	<.001
Sexual abuse	10.4 ± 7.0	5.0 ± 0.2	6.05	<.001
Mother-rated PBI				
Care/control	32.1 ± 12.5	45.6 ± 9.3	-6.04	<.001
Overprotection	9.7 ± 4.8	13.7 ± 3.5	-4.77	<.001
Father-rated PBI				
Care/control	26.7 ± 16.5	43.3 ± 11.9	-5.55	<.001
Overprotection	9.4 ± 5.9	15.1 ± 3.7	-5.15	<.001
ISAS				
Affect regulation	2.8 ± 1.9	NA	NA	NA
Anti-suicide	1.9 ± 1.7	NA	NA	NA
Marking distress	2.34 ± 1.8	NA	NA	NA
Self-punishment	2.2 ± 2.0	NA	NA	NA
Anti-dissociation	1.8 ± 1.7	NA	NA	NA
Interpersonal boundaries	1.5 ± 1.4	NA	NA	NA
Interpersonal influence	1.7 ± 1.6	NA	NA	NA
Revenge	2.0 ± 1.7	NA	NA	NA
Sensation seeking	1.4 ± 1.4	NA	NA	NA
Peer bonding	0.9 ± 1.2	NA	NA	NA
Toughness	1.8 ± 1.8	NA	NA	NA
Autonomy	1.5 ± 1.6	NA	NA	NA
Self-care	2.0 ± 1.7	NA	NA	NA
Autonomic functions	11.2 ± 7.0	NA	NA	NA
Social functions	12.8 ± 9.1	NA	NA	NA

Abbreviations: CTQ, child trauma questionnaire; ISAS, inventory of statements about self-injury; NA, non-applicable; PBI, parental bonding instrument.

Linear regression analyses (forward conditional) were also used to evaluate the relationships between the ISAS Autonomic Functions and Social Functions scores and the CTQ-28 and PBI scores in the patient group. We included the questionnaire and inventory scores that significantly correlated with the ISAS Autonomic Functions and ISAS Social Functions scores as independent variables. The analyses showed that only mother PBI Care/control and sexual abuse score had a relationship with both ISAS Autonomic Functions and ISAS Social Functions scores. Additionally, Physical Neglect score had a relationship only ISAS Social Function score. The results of the regression analyses are shown in Tables 3 and 4 in detail.

4 | DISCUSSION

In this study, we found that adolescents with NSSI have more negative characteristics than their peers without NSSI in terms of all childhood traumas and attachment to both parents. In addition, we found

that the maternal attachment-care/control subscale and sexual abuse had a significant relationship with both the autonomous and social functions of the NSSI.

The NSSI method used may vary. In a review, it was reported that cutting, hitting, and burning were the most common NSSI methods (Klonsky, 2007). Similarly, in our study the most commonly used methods were cutting, hitting the head, and preventing wound healing. NSSI is thought to be associated with both intrapersonal and interpersonal factors (Jutengren et al., 2011; Rodav et al., 2014). The most emphasized reasons for NSSI in the studies are affect regulation, dissociation prevention, suicide prevention, interpersonal boundary setting, interpersonal interaction, self-punishment, and sensation seeking (Klonsky, 2007). In a recent meta-analysis, internal factors, particularly emotion regulation, were the most common NSSI function, while interpersonal factors were less frequent (Taylor et al., 2018). Similar to the current literature, the most common causes in our study were emotion regulation, marking distress, self-punishment, revenge and self-care.

TABLE 1 Comparison of psychological test scores of study and control groups.

TABLE 2 Correlations of the ISAS scores with the CTQ-28 and PBI scores in adolescents with NSSI.

	ISAS-AR	ISAS-AS	ISAS-MD	ISAS-SP	ISAS-AD	ISAS-IB	ISAS-II	ISAS-R	ISAS-SS	ISAS-PB	ISAS-T	ISAS-A	ISAS-SC	ISAS-AF	ISAS-SF
CTQ-28 EA	.25	-.01	.16	.28	.31	.26	.16	.34	.33	.31	.36	.37	.40*	.25	.43*
CTQ-28 EN	.18	-.02	.09	.14	.09	.28	.18	.04	.31	.19	.28	.30	.21	.12	.28
CTQ-28 PA	.20	-.11	.14	.22	.33	.09	.02	.10	.34	.20	.21	.11	.13	.18	.21
CTQ-28 PN	.35	.13	.32	.30	.27	.34	.43*	.25	.36	.34	.48*	.40*	.35	.36	.50*
CTQ-28 SA	.32	.23	.19	.35	.16	.25	.29	.40*	.36	.35	.28	.28	.29	.32	.39*
Mother PBI care/control	-.40*	-.25	-.22	-.34	-.35	-.44*	-.32	-.30	-.40*	-.23	-.41*	-.46*	-.34	-.38	-.48*
Mother PBI overprotection	-.01	.22	-.12	-.02	-.01	-.06	.22	-.04	-.04	-.04	-.06	.13	.05	.01	.03
Father PBI care/control	-.07	-.02	.09	-.08	.09	.12	-.12	.01	.10	-.13	-.10	-.03	-.10	.27	-.07
Father PBI overprotection	-.14	-.10	-.22	-.14	.06	-.07	-.25	.11	-.01	-.15	-.15	.06	.05	-.17	-.07

Abbreviations: A, autonomy; AD, anti-dissociation; AF, autonomic functions; AR, affect regulation; AS, anti-suicide; CTQ, child trauma questionnaire; EA, emotional abuse; EN, emotional neglect; IB, interpersonal boundaries; II, interpersonal influence; ISAS, inventory of statements about self-injury; MD, marking distress; PA, physical abuse; PB, peer bonding; PBI, parental bonding instrument; PN, physical neglect; R, revenge; SA, sexual abuse; SC, self-care; SF, self-punishment; SF, social functions; SS, sensation seeking; T, toughness.

*Statistically significant correlations (Significance level was determined as $p \leq .005$ according to the Benjamini-Hochberg procedure).

Existing studies in the literature, have investigated the psychological motivation for NSSI and different explanatory models—affect regulation model, interpersonal/systemic model, physiological/biological model, behavioural/environmental model, suicide model, sexual model/sadomasochism, depersonalization model—have emerged (Braga & Gonçalves, 2014). In the context of these models the parental attachment relationships has become to a subject of interest. Attachment theory explains how attachment insecurity develops and interferes with emotional regulation, social adjustment, and mental health (Mikulincer & Shaver, 2007). Studies have shown that there is a relationship between insecure attachment styles and NSSI (Gratz et al., 2002; Kimball & Diddams, 2007; Levesque et al., 2010; Molaie et al., 2019). Attachment to mother and father may affect psychological outcomes differently (Freeman et al., 2010). However, studies evaluating paternal attachment with NSSI are limited. While some studies show the relationship between NSSI frequency and both maternal and paternal attachment (Di Pierro et al., 2012; Gratz et al., 2002); others have shown that perceptions of relationship with fathers are a better predictor of NSSI than with mothers (Hallab & Covic, 2010; Hilt et al., 2008). In our study, both mother and father attachment characteristics of adolescents with NSSI were more negative than their healthy peers in all dimensions. Although insecure attachment is common in NSSI, it is not clear how insecure attachment causes NSSI in young people. Intrapersonal factors such as emotional regulation, academic stress and depression, and interpersonal factors such as parenting and peer relationships may also play an important role (Nock & Prinstein, 2004). These variables may play a mediator role in the relationship between insecure attachment and NSSI. Insecure attachment styles, on the other hand, can hinder socio-emotional development and the development of effective coping strategies and problem-solving skills needed in challenging situations (Mikulincer et al., 2003). The relationship of the NSSI to a wide range of functions, including emotion regulation, self-punishment, or distress communication (Edmondson et al., 2016; Klonsky, 2007), may mediate its relationship to attachment.

In our study, we found that all types of childhood traumas, were more common in those with NSSI compared to those without NSSI. In a systematic review of studies conducted in different age groups, childhood maltreatment was found to be a risk factor for NSSI (Ford & Gómez, 2015). Also, NSSI was associated with higher abuse history in adolescent students in a longitudinal study (Garisch & Wilson, 2015). There are different findings in the literature regarding the relationship between types of maltreatment and NSSI in adolescence. In a study evaluating the specificity of childhood maltreatment (child physical, sexual, emotional abuse and emotional, physical neglect), as factors associated with NSSI in a sample of inpatient adolescents, results indicated that only child emotional abuse was directly associated with NSSI (Thomassin et al., 2016). In the study by Glassman et al., there was strong relations between emotional and sexual abuse with NSSI (Glassman et al., 2007). These findings of the literature support the association between childhood trauma and NSSI but there are differences regarding maltreatment types. Different results in studies may be due to variables such as retrospective questioning

TABLE 3 Results of linear regression (forward conditional) related to the ISAS autonomic functions scores of adolescents with NSSI.

	B	SE	β	t	p	Confidence interval (%95)
Log-CTQ-28 sexual abuse	0.370	0.213	.370	4.508	<.001	0.539–1.385
Log-mother PBI care/control	−0.785	0.246	−.418	−3.189	<.001	−1.649–−0.743

Note: $R^2 = 0.483$, Adjusted $R^2 = 0.473$, $F = 48.028$, $p < .001$.

Abbreviations: CTQ, child trauma questionnaire; PBI, parental bonding instrument.

TABLE 4 Results of linear regression (forward conditional) related to the ISAS social functions scores of adolescents with NSSI.

	B	SE	β	t	p	Confidence interval (%95)
Log-mother PBI care/control	−0.951	0.249	−.331	−3.818	<.001	−1.446–−0.457
Log-CTQ-28 sexual abuse	0.893	0.223	.333	4.003	<.001	0.451–1.336
Log-CTQ-28 physical neglect	0.868	0.357	.212	2.431	.017	0.160–1.577

Note: $R^2 = 0.528$, Adjusted $R^2 = 0.514$, $F = 37.996$, $p < .001$.

Abbreviations: CTQ, child trauma questionnaire; PBI, parental bonding instrument.

of trauma, differences in personal trauma perception, and protective factors from trauma. In our study, we found trauma scores higher in patients with NSSI than in those without. We also found significant results regarding the effect of especially sexual abuse on NSSI functions. In the study of Glassman et al. (2007), similar to our study, small-to-moderate relationships were found between childhood traumas, especially sexual abuse, and NSSI, while another study found no evidence for the predictive role of sexual abuse in NSSI (Swannell et al., 2012). Various studies have shown that there is an indirect relationship between childhood traumas and NSSI, and mediator variables play a role (Shenk et al., 2010; Zetterqvist et al., 2014). Differences between studies may be due to the effect of mediator variables. Follow-up studies on the direct and indirect effects of childhood traumas on NSSI development and functions will contribute to a better understanding of the subject.

Suicide attempt is common with NSSI and a history of NSSI is a strong predictor of completed suicide (Hawton et al., 2003; Muehlenkamp & Gutierrez, 2007). Similarly, more than half of the NSSI patients in our study had attempted suicide. And those who attempted suicide had significantly lower scores on the mother care/control subscale of PBI compared to those who did not. In the literature, it has been shown that adolescents who attempt suicide have worse attachment to their parents compared to their non-suicidal peers (Saffer et al., 2015; Sheftall et al., 2013). In our study, the fact that NSSI patients who attempted suicide had worse attachment to their mothers could be interpreted as the fact that positive attachment with the mother could protect these patients from suicide attempts, and more research is needed on this subject.

Factors such as early close relationships, parental care or neglect are likely to affect both attachment and exposure to traumatic experiences and trauma outcomes. In our study, there was a significant relationship between the autonomic and social functions of the NSSI and some childhood trauma subtypes and the care and control subdimensions of maternal attachment. However, in the regression analyzes, only the maternal attachment care/control and sexual abuse 3 subscale had a significant effect on both the autonomic and social

functions of the NSSI. These results suggest that secure attachment with the mother may be protective for both the intrapersonal and interpersonal functions of the NSSI. It is known that attachment can be flexible and change over time (Hallab & Covic, 2010). In this context, interventions for dysfunctional parental attachment may be protective against NSSI.

The study has some important limitations. First of all, we did not evaluate the psychiatric diagnoses and focused only on the presence of NSSI. In addition, the fact that the control group consisted of healthy subjects prevents us from evaluating the effect of the presence of psychopathology on our results. Therefore, in future studies, it would be useful to compare clinical samples with NSSI with clinical samples without NSSI and adolescents with NSSI who did not present to the clinic. Also the small sample size, the inability to make comparisons between the genders, and the inability to establish a cause-effect relationship due to the cross-sectional design are the limitations of our study. Therefore, further studies with larger sample sizes are needed. Despite the limitations; the strength of our study was to evaluate the attachment and childhood traumas, which are two important factors in early childhood experiences that may be associated with NSSI, and to investigate the attachment separately for both mothers and fathers. In addition, in order to exclude the presence of NSSI in the control group, it was important to ask about the presence of NSSI methods one by the help of a scale. Because when asked with more than one item, it was reported that NSSI was found at a higher rate than when asked with a single question (Muehlenkamp & Gutierrez, 2007). Also our study was one of the rare studies in this area for having a sample consists of inpatients, but of course at the same time this can also prevent the generalization of the findings.

In conclusion, although the generalizability of the results is limited, this study indicates that problems related to paternal attachment as well as maternal attachment are more common in NSSI cases, but the relationship between attachment and NSSI stems from maternal attachment. Therefore, it suggests that studies to strengthen mother-child attachment may be valuable for the prevention and treatment of NSSI.

ACKNOWLEDGEMENTS

We wish to thank all the patients who participated in this study and their parents and staff of the participating center.

FUNDING INFORMATION

We have no funding sources that supported our work.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Kayhan Bahali  <https://orcid.org/0000-0002-7950-9074>
 Gizem Durcan  <https://orcid.org/0000-0002-7863-4551>
 Melike Topal  <https://orcid.org/0000-0002-4965-6575>
 Bedia Sultan Önal  <https://orcid.org/0000-0003-2818-4764>
 Ayhan Bilgiç  <https://orcid.org/0000-0003-0703-2630>
 Canan Tanıdır  <https://orcid.org/0000-0002-6272-4480>
 Tuğçe Aytemiz  <https://orcid.org/0000-0002-4494-2660>

REFERENCES

- Bernstein, D. P., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., Sapareto, E., & Ruggiero, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *American Journal of Psychiatry*, 151(8), 1132–1136. <http://psychiatryonline.org/doi/abs/10.1176/ajp.151.8.1132>
- Bildik, T., Somer, O., Kabukcu Basay, B., Basay, O., & Ozbaran, B. (2012). The validity and reliability of the Turkish version of the inventory of statements about self-injury. *Turkish Journal of Psychiatry*, 24(1), 41–49. Available from: <http://www.turkpsikiyatri.com/default.aspx?modul=doi&doi=u6901>
- Braga, C., & Gonçalves, S. (2014). Non-suicidal self injury, psychopathology and attachment: A study with university students. *Spanish Journal of Psychology*, 27(17), E66 Available from: https://www.cambridge.org/core/product/identifier/S1138741614000663/type/journal_article
- Brown, M., Worrell, C., & Pariante, C. M. (2021). Inflammation and early life stress: An updated review of childhood trauma and inflammatory markers in adulthood. *Pharmacology, Biochemistry, and Behavior*, 211, 173291 Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0091305721001908>
- Brown, R. C., & Plener, P. L. (2017). Non-suicidal self-injury in adolescence. *Current Psychiatry Reports*, 19(3), 20. <http://link.springer.com/10.1007/s11920-017-0767-9>
- Cassels, M., Baetens, I., Wilkinson, P., Hoppenbrouwers, K., Wiersema, J. R., Van Leeuwen, K., & Kiekens, G. (2019). Attachment and non-suicidal self-injury among young adolescents: The indirect role of behavioral problems. *Archives of Suicide Research*, 23(4), 688–696. <https://www.tandfonline.com/doi/full/10.1080/13811118.2018.1494651>
- Di Pierro, R., Sarno, I., Perego, S., Gallucci, M., & Madeddu, F. (2012). Adolescent non-suicidal self-injury: The effects of personality traits, family relationships and maltreatment on the presence and severity of behaviours. *European Child and Adolescent Psychiatry*, 21(9), 511–520. <http://link.springer.com/10.1007/s00787-012-0289-2>
- Edmondson, A. J., Brennan, C. A., & House, A. O. (2016). Non-suicidal reasons for self-harm: A systematic review of self-reported accounts. *Journal of Affective Disorders*, 191, 109–117. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0165032715307485>
- Ford, J. D., & Gómez, J. M. (2015). The relationship of psychological trauma and dissociative and posttraumatic stress disorders to non-suicidal self-injury and suicidality: A review. *Journal of Trauma and Dissociation*, 16(3), 232–271. <http://www.tandfonline.com/doi/full/10.1080/15299732.2015.989563>
- Freeman, H., Newland, L. A., & Coyl, D. D. (2010). New directions in father attachment. *Early Child Development and Care*, 180(1–2), 1–8. <http://www.tandfonline.com/doi/abs/10.1080/03004430903414646>
- Gandhi, A., Claes, L., Bosmans, G., Baetens, I., Wilderjans, T. F., Maitra, S., Kiekens, G., & Luyckx, K. (2016). Non-suicidal self-injury and adolescents attachment with peers and mother: The mediating role of identity synthesis and confusion. *Journal of Child and Family Studies*, 25(6), 1735–1745. <http://link.springer.com/10.1007/s10826-015-0350-0>
- Garisch, J. A., & Wilson, M. S. (2015). Prevalence, correlates, and prospective predictors of non-suicidal self-injury among New Zealand adolescents: Cross-sectional and longitudinal survey data. *Child and Adolescent Psychiatry and Mental Health*, 9(1), 28. <http://capmh.biomedcentral.com/articles/10.1186/s13034-015-0055-6>
- Gholamrezaei, M., De Stefano, J., & Heath, N. L. (2017). Nonsuicidal self-injury across cultures and ethnic and racial minorities: A review. *International Journal of Psychology*, 52(4), 316–326. <https://onlinelibrary.wiley.com/doi/10.1002/ijop.12230>
- Glassman, L. H., Weierich, M. R., Hooley, J. M., Deliberto, T. L., & Nock, M. K. (2007). Child maltreatment, non-suicidal self-injury, and the mediating role of self-criticism. *Behaviour Research and Therapy*, 45(10), 2483–2490. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0005796707000824>
- Gratz, K. L., Conrad, S. D., & Roemer, L. (2002). Risk factors for deliberate self-harm among college students. *American Journal of Orthopsychiatry*, 72(1), 128–140. <http://doi.apa.org/getdoi.cfm?doi=10.1037/0002-9432.72.1.128>
- Hallab, L., & Covic, T. (2010). Deliberate self-harm: The interplay between attachment and stress. *Behaviour Change*, 27(2), 93–103. Available from: https://www.cambridge.org/core/product/identifier/S081348390000259X/type/journal_article
- Hawton, K., Zahl, D., & Weatherall, R. (2003). Suicide following deliberate self-harm: Long-term follow-up of patients who presented to a general hospital. *British Journal of Psychiatry*, 182(6), 537–542. Available from: https://www.cambridge.org/core/product/identifier/S0007125000229061/type/journal_article
- Hilt, L. M., Nock, M. K., Lloyd-Richardson, E. E., & Prinstein, M. J. (2008). Longitudinal study of non-suicidal self-injury among young adolescents. *Journal of Early Adolescence*, 28(3), 455–469. <http://journals.sagepub.com/doi/10.1177/0272431608316604>
- Jiang, Y., You, J., Zheng, X., & Lin, M.-P. (2017). The qualities of attachment with significant others and self-compassion protect adolescents from non suicidal self-injury. *School Psychology Quarterly*, 32(2), 143–155. <http://doi.apa.org/getdoi.cfm?doi=10.1037/spq0000187>
- Jutengren, G., Kerr, M., & Stattin, H. (2011 Apr). Adolescents' deliberate self-harm, interpersonal stress, and the moderating effects of self-regulation: A two-wave longitudinal analysis. *Journal of School Psychology*, 49(2), 249–264. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0022440510000804>
- Kapçı, E., & Küçükler, S. (2006). Ana babaya bağlanma ölçeği: Türk üniversite öğrencilerinde psikometrik özelliklerinin değerlendirilmesi. *Türk Psikiyatri Dergisi*, 17(4), 286–295.
- Kimball, J. S., & Diddams, M. (2007). Affect regulation as a mediator of attachment and deliberate self-harm. *Journal of College Counseling*, 10(1), 44–53. <https://onlinelibrary.wiley.com/doi/10.1002/j.2161-1882.2007.tb00005.x>
- Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*, 27(2), 226–239. Available

- from: <https://linkinghub.elsevier.com/retrieve/pii/S0272735806000961>
- Klonsky, E. D., & Glenn, C. R. (2009). Assessing the functions of non-suicidal self-injury: Psychometric properties of the inventory of statements about self-injury (ISAS). *Journal of Psychopathology and Behavioral Assessment*, 31(3), 215–219. <http://link.springer.com/10.1007/s10862-008-9107-z>
- Levesque, C., Lafontaine, M.-F., Bureau, J.-F., Cloutier, P., & Dandurand, C. (2010). The influence of romantic attachment and intimate partner violence on non-suicidal self-injury in young adults. *Journal of Youth and Adolescence*, 39(5), 474–483. <http://link.springer.com/10.1007/s10964-009-9471-3>
- Lovell, S., & Clifford, M. (2016). Nonsuicidal self-injury of adolescents. *Clinical Pediatrics (Phila)*, 55(11), 1012–1019.
- Mannekote Thippaiah, S., Shankarapura Nanjappa, M., Gude, J. G., Voyiazakis, E., Patwa, S., Birur, B., & Pandurangi, A. (2021). Non-suicidal self-injury in developing countries: A review. *The International Journal of Social Psychiatry*, 67(5), 472–482. <http://journals.sagepub.com/doi/10.1177/0020764020943627>
- Mikulincer, M., & Shaver, P. R. (2007). Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological Inquiry*, 18(3), 139–156. <http://www.tandfonline.com/doi/abs/10.1080/10478400701512646>
- Mikulincer, M., Shaver, P. R., & Pereg, D. (2003). Attachment theory and affect regulation: The dynamics, development, and cognitive consequences of attachment-related strategies. *Motivation and Emotion*, 27(2), 77–102.
- Molaie, A. M., Chiu, C.-Y., Habib, Z., Galynker, I., Briggs, J., Rosenfield, P. J., Calati, R., & Yaseen, Z. S. (2019). Emotional pain mediates the link between preoccupied attachment and non-suicidal self-injury in high suicide risk psychiatric inpatients. *Frontiers in Psychology*, 21, 10. <https://www.frontiersin.org/article/10.3389/fpsyg.2019.00289/full>
- Muehlenkamp, J. J., & Gutierrez, P. M. (2007). Risk for suicide attempts among adolescents who engage in non-suicidal self-injury. *Archives of Suicide Research*, 11(1), 69–82. <http://www.tandfonline.com/doi/abs/10.1080/13811110600992920>
- Mummé, T. A., Mildred, H., & Knight, T. (2017). How do people stop non-suicidal self-injury? A systematic review. *Archives of Suicide Research*, 21(3), 470–489. <https://www.tandfonline.com/doi/full/10.1080/13811118.2016.1222319>
- Nock, M. K., & Favazza, A. R. (2009). Nonsuicidal self-injury: Definition and classification. In *Understanding nonsuicidal self-injury: Origins, assessment, and treatment* (pp. 9–18). American Psychological Association Available from: <http://content.apa.org/books/11875-001>
- Nock, M. K., & Prinstein, M. J. (2004). A functional approach to the assessment of self-mutilative behavior. *Journal of Consulting and Clinical Psychology*, 72(5), 885–890. <http://doi.apa.org/getdoi.cfm?doi=10.1037/0022-006X.72.5.885>
- Paquette, D., & Bigras, M. (2010). The risky situation: A procedure for assessing the father–child activation relationship. *Early Child Development and Care*, 180(1–2), 33–50. <http://www.tandfonline.com/doi/abs/10.1080/03004430903414687>
- Parker, G., Tupling, H., & Brown, L. B. (1979). A parental bonding instrument. *British Journal of Medical Psychology*, 52(1), 1–10. <http://doi.wiley.com/10.1111/j.2044-8341.1979.tb02487.x>
- Rodav, O., Levy, S., & Hamdan, S. (2014). Clinical characteristics and functions of non-suicide self-injury in youth. *European Psychiatry*, 29(8), 503–508. Available from: https://www.cambridge.org/core/product/identifier/S0924933800244684/type/journal_article
- Saffer, B. Y., Glenn, C. R., & David, K. E. (2015). Clarifying the relationship of parental bonding to suicide ideation and attempts. *Suicide and Life-Threatening Behavior*, 45(4), 518–528. <https://onlinelibrary.wiley.com/doi/10.1111/sltb.12146>
- Şar, V., Öztürk, E., & İkikardeş, E. (2012). Validity and reliability of the Turkish version of childhood trauma questionnaire. *Turkiye Klinikleri Journal of Medical Sciences*, 32(4), 1054–1063. Available from: <http://www.turkiyeklinikleri.com/article/en-validity-and-reliability-of-the-turkish-version-of-childhood-trauma-questionnaire-62682.html>
- Serafini, G., Adavastro, G., Canepa, G., De Berardis, D., Valchera, A., Pompili, M., Nasrallah, H., & Amore, M. (2018). The efficacy of buprenorphine in major depression, treatment-resistant depression and suicidal behavior: A systematic review. *International Journal of Molecular Sciences*, 19(8), 2410 Available from: <http://www.mdpi.com/1422-0067/19/8/2410>
- Serafini, G., Canepa, G., Adavastro, G., Nebbia, J., Belvederi Murri, M., Erbuto, D., Poci, B., Fiorillo, A., Pompili, M., Flouri, E., & Amore, M. (2017). The relationship between childhood maltreatment and non-suicidal self-injury: A systematic review. *Frontiers in Psychiatry*, 24, 8. <http://journal.frontiersin.org/article/10.3389/fpsyg.2017.00149/full>
- Serafini, G., Parisi, V. M., Aguglia, A., Amerio, A., Sampogna, G., Fiorillo, A., Pompili, M., & Amore, M. (2020). A specific inflammatory profile underlying suicide risk? Systematic review of the main literature findings. *International Journal of Environmental Research and Public Health*, 17(7), 2393 Available from: <https://www.mdpi.com/1660-4601/17/7/2393>
- Sheftall, A. H., Mathias, C. W., Furr, R. M., & Dougherty, D. M. (2013). Adolescent attachment security, family functioning, and suicide attempts. *Attachment and Human Development*, 15(4), 368–383. <https://www.tandfonline.com/doi/full/10.1080/14616734.2013.782649>
- Shenk, C. E., Noll, J. G., & Cassarly, J. A. (2010). A multiple mediational test of the relationship between childhood maltreatment and non-suicidal self-injury. *Journal of Youth and Adolescence*, 39(4), 335–342.
- Swannell, S., Martin, G., Page, A., Hasking, P., Hazell, P., Taylor, A., & Protani, M. (2012). Child maltreatment, subsequent non-suicidal self-injury and the mediating roles of dissociation, alexithymia and self-blame. *Child Abuse and Neglect*, 36(7–8), 572–584. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0145213412001202>
- Taylor, P. J., Jomar, K., Dhingra, K., Forrester, R., Shahmalak, U., & Dickson, J. M. (2018). A meta-analysis of the prevalence of different functions of non-suicidal self-injury. *Journal of Affective Disorders*, 227, 759–769. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0165032717315227>
- Thomassin, K., Shaffer, A., Madden, A., & Londino, D. L. (2016). Specificity of childhood maltreatment and emotion deficit in nonsuicidal self-injury in an inpatient sample of youth. *Psychiatry Research*, 244, 103–108. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0165178115305862>
- Zetterqvist, M. (2015). The DSM-5 diagnosis of nonsuicidal self-injury disorder: A review of the empirical literature. *Child and Adolescent Psychiatry and Mental Health*, 9(1), 31. <http://capmh.biomedcentral.com/articles/10.1186/s13034-015-0062-7>
- Zetterqvist, M., Lundh, L.-G., & Svedin, C. (2014). A cross-sectional study of adolescent non-suicidal self-injury: Support for a specific distress-function relationship. *Child and Adolescent Psychiatry and Mental Health*, 8(1), 23. <http://capmh.biomedcentral.com/articles/10.1186/1753-2000-8-23>

How to cite this article: Bahali, K., Durcan, G., Topal, M., Önal, B. S., Bilgiç, A., Tanıdır, C., Aytemiz, T., & Yazgan, Y. (2023). Parental attachment and childhood trauma in adolescents engaged in non-suicidal self-injury. *Early Intervention in Psychiatry*, 1–8. <https://doi.org/10.1111/eip.13452>