



## RESEARCH ARTICLE

# Nonsuicidal self-injury in adolescents: Role of sociodemographic and clinical factors, emotion regulation, and maladaptive personality traits

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### ABSTRACT

**Objective:** This study aims to assess the individual and psychosocial factors related to nonsuicidal self-injury (NSSI).

**Method:** This study included patients with NSSI (n=44), non-NSSI patients (n=37), and a healthy control group (n=38) between 12 and 18 years of age. The clinical interviews were conducted with all participants. The participants completed an information form, the Difficulties in Emotion Regulation Scale (DERS), and the Personality Inventory for DSM-5-Brief Form.

**Results:** In our findings, NSSI was associated with difficulties in peer relationships, disruption in family unity, domestic violence, smoking, sexual abuse, physical abuse, and suicidal ideation history. Patients in the NSSI group showed higher scores on the DERS than those in other groups. They also showed a higher level of maladaptive personality traits compared with adolescents in other groups. Our findings showed that NSSI was associated with suicidal ideation history and maladaptive personality traits.

**Conclusion:** The existing literature and our findings indicate that previous suicidal ideation and maladaptive personality traits might be suggestive of NSSI. Considering these potential risk factors would allow clinicians to develop more suitable early intervention, follow-up, and treatment strategies for NSSI in the adolescent population.

**Keywords:** Adolescent, emotion regulation, nonsuicidal self-injury, personality, risk factors

## INTRODUCTION

Nonsuicidal self-injury (NSSI) is defined as intentional and direct self-inflicted damage without suicidal tendencies (1). NSSI is included under the title of "personal history of self-harm" as a new diagnostic category in the "other conditions that may be a focus of clinical attention" section in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (2). NSSI is a mental health problem with

increasing importance and prevalence, especially among adolescents (1). Zoroglu et al. (3) found that the prevalence of NSSI among high-school students was 21.4%. Recently, many studies performed in Western countries also showed an increase in the prevalence of NSSI, which is now considered a public health issue (4,5). While NSSI can be a short-term behavior in a challenging time of adolescence, it might be an indication of future mental health problems or increased suicide attempts (6).

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Studies on adolescents with NSSI showed that physical, sexual, and emotional abuse are associated with NSSI (7–9). Additionally, peer bullying, having friends with NSSI, alcohol-drug abuse, smoking, and impulsivity have been found related to NSSI in adolescents (10,11).

The clinical studies indicate that NSSI is accompanied by psychiatric disorders at a high rate. A study including 89 adolescents with NSSI determined that 88% displayed at least one psychiatric disorder (12). Psychiatric disorders, such as depression, anxiety disorders, posttraumatic stress disorders, dissociative disorders, substance use disorders, conduct disorders, eating disorders, and personality disorders, especially histrionic and borderline personality disorders, are common among adolescents with NSSI (13).

Previous studies have investigated the characteristics of NSSI. However, their control groups were selected among healthy adolescents. Certain distal and proximal determinants, such as neglect, physical and sexual abuse, substance abuse, loss of caregivers, presence of physical or mental illness of the caregiver, domestic violence, and substance use by the caregiver, are documented risk factors for both NSSI and mental disorders (14,15). However, there is a necessity to distinguish such an overlap, which is important for a clearer assessment of NSSI. Therefore, one step ahead of previous studies, the control groups of this study comprised adolescents with mental disorders (with no NSSI) and healthy adolescents to evaluate the factors associated with NSSI more clearly. We hypothesized that (i) individual (maladaptive personality traits, emotion regulation difficulties, and exposure to abuse) and familial (disruption of the family unity and domestic violence) factors are more prominent in patients with NSSI and mental disorders than in patients without NSSI and healthy adolescents and (ii) there is a robust association between NSSI and personality traits, including emotion regulation difficulties and maladaptive personality traits.

## METHODS

### Study Sample

Prior to the study, we calculated the sample size using the power analysis method. To reach an effect size of 0.70 and a power of 0.80 ( $\alpha=0.05$ ), we required a minimum sample of 33/33/33 people. This study included 3 sample groups with 119 adolescents in total. We selected the patient group among NSSI

[NSSI(+)] or non-NSSI (NSSI(-)) adolescents admitted to the child psychiatry outpatient clinic of Manisa Celal Bayar University (MCBU) Hafsa Sultan Hospital between October 2018 and December 2019. The presence of NSSI was evaluated with a detailed clinical interview. NSSI is defined as deliberate, direct destruction of body tissue with no conscious suicidal intent. NSSI is a socially unacceptable, alarming, and disturbing phenomenon involving mainly skin lesions (e.g., cutting or carving the skin; picking at a wound; scraping, erasing, or picking the skin until it bleeds; self-biting; inserting objects under the skin; self-tattooing; burning or freezing the skin; pulling hair out; and self-hitting) (16). The NSSI(+) group consisted of 12–18-year-old adolescents with a psychiatric disorder and with at least one NSSI event in the last year ( $n=44$ ). We selected the NSSI(-) group among 12–18-year-old adolescents without NSSI but with a psychiatric disorder ( $n=37$ ). The healthy group consisted of adolescents visiting a pediatric health and diseases outpatient clinic without NSSI, psychiatric treatment history, chronic disease, and mental disorders ( $n=38$ ). We did not include adolescents diagnosed with psychotic disorder, intellectual disability, and autism spectrum disorder through a structured clinical interview. We excluded these patients because they could not cooperate with the scales, and illness-specific self-harming behaviors in these patients may confound our data. We obtained written consent from both the adolescents and their parents who agreed to participate in the study. We collected the permissions from the MCBU Medical School Health Science Ethical Board with the number 20.478.486 and dated September 12, 2018.

### Procedure

Participants were enrolled in the study before treatment was initiated, usually at the first admission to the clinic. Participants were recruited during the 6-month period approved by the ethics committee. Clinical interviews were performed by the child and adolescent psychiatrists who were trained administrators of the psychometric instruments used in the study. NSSI assessment and Schedule for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime (Kiddie-SADS-PL) were applied by researchers to all adolescents participating in the study. Every participant completed the information form, the Difficulties in Emotional Regulation Scale (DERS), and the The Personality Inventory for DSM-5 Brief Form (PID-5-BF) child form.

**Table 1: Sociodemographic characteristics**

	NSSI(+)		NSSI(-)		HC		$\chi^2$	df	p
	n	%	n	%	n	%			
Gender									
Male	4	9.1	8	21.6	15	39.5	10.765	2	<b>0.005</b> NSSI(+) > HC
Female	40	90.9	29	78.4	23	60.5			
	Mean		Mean		Mean		F*		p
Age	15.45		14.86		15.21		1.366		0.259
Mother's educational background									
Primary school	31	70.5	19	51.4	19	50	5.426	4	0.246
High school	8	18.1	13	35.1	10	26.3			
University	5	11.4	5	13.5	8	21.1			
Father's educational background									
Primary school	29	65.9	22	59.5	16	42.1	6.150	4	0.188
High school	8	18.1	9	24.3	9	23.7			
University	7	15.9	4	10.8	11	28.9			
School performance <sup>†</sup>									
Very good/good	16	36.4	14	37.8	29	76.3	17.203	4	<b>0.002</b> NSSI(+) > HC NSSI(-) > HC
Moderate	18	40.9	15	40.5	9	23.7			
Bad/very bad	9	20.5	6	16.2	0	0			
Relationship with friends <sup>†</sup>									
Very good/good	25	56.8	27	73	34	89.5	16.936	4	<b>0.002</b> NSSI(+) > NSSI(-) NSSI(+) > HC
Moderate	13	29.5	10	27	4	10.5			
Bad/very bad	6	13.6	0	0	0	0			
Mother currently working	10	22.7	13	35.1	17	44.7	4.872	2	0.087
Father currently working <sup>†</sup>	41	93.2	35	94.5	35	92.1	2.776	2	0.250

\*: One-way ANOVA test; post hoc: Tukey's B test; †: Fisher's exact test;  $\chi^2$ : Chi-squared test; NSSI: Nonsuicidal self-injury; NSSI(+): NSSI patient; NSSI(-): Non-NSSI patient; HC: Healthy control.  $p < 0.05$  is significant (bold values).

## Data Collection Tools

### Information Form

This form was created by the authors based on the related literature. The form includes questions about age, gender, socioeconomic level, academic status, friendship (e.g., friendship perception), smoking, alcohol and substance use history, psychiatric treatment, physical and sexual abuse, and suicidal ideation history (current and/or past suicidal ideation).

Schedule for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime (Kiddie-SADS-PL)

This is a semistructured interview developed to investigate the current and life-long psychopathology of 6–18-year-old children according to DSM-5 criteria (17). The validity and reliability study in the Turkish language was

published in 2019. Results of this study showed that the schedule is an effective instrument for diagnosing major childhood psychiatric disorders (18).

### Difficulties in Emotion Regulation Scale (DERS)

This scale was developed by Gratz and Roemer (19). The validity and reliability study was conducted in the Turkish language (20). The 36-question scale assesses the difficulties in emotion regulation from different perspectives. The scale comprises six subscales: purpose, strategy, impulsivity, awareness, clarity, and nonacceptance. These subscales investigate emotional clarity, the awareness and acceptance of negative emotions, the maintenance of purposeful functions during a negative effect, and the development of strategies and the difficulties in controlling impulses. We assessed the total score of the scale as well as the subscale scores (19).

**Table 2: Individual and familial factors related to NSSI**

	NSSI(+)		NSSI(-)		HC		$\chi^2$	df	p
	n	%	n	%	n	%			
History of psychiatric treatment	27	61.4	20	54.1	4	10.5	24.267	2	<b>&lt;0.001</b> NSSI(+) > HC NSSI(-) > HC
Smoking cigarettes	16	36.4	5	13.5	1	2.7	16.277	2	<b>&lt;0.001</b> NSSI(+) > NSSI(-) NSSI(+) > HC
Alcohol consumption	11	25	5	13.5	6	15.8	2.029	2	0.363
Substance abuse <sup>†</sup>	2	4.5	0	0	0	0	3.467	2	0.133
Suicidal ideation history	36	81.8	13	35.1	2	5.3	50.103	2	<b>&lt;0.001</b> NSSI(+) > NSSI(-) > HC
Sexual abuse history <sup>†</sup>	10	22.7	2	5.4	0	0	13.282	2	<b>0.001</b> NSSI(+) > NSSI(-) NSSI(+) > HC
Physical abuse history	20	45.5	3	8.1	0	0	32.261	2	<b>&lt;0.001</b> NSSI(+) > NSSI(-) NSSI(+) > HC
Family unity <sup>†</sup> Not living with family	12	27.3	3	8.1	0	0	14.753	2	<b>0.001</b> NSSI(+) > NSSI(-) NSSI(+) > HC
Domestic violence <sup>†</sup>	12	27.3	3	8.1	0	0	14.753	2	<b>0.001</b> NSSI(+) > NSSI(-) NSSI(+) > HC

†: Fisher's exact test;  $\chi^2$ : Chi-squared test; NSSI: Nonsuicidal self-injury; NSSI(+): NSSI patient; NSSI(-): Non-NSSI patient; HC: Healthy control. p<0.05 is significant (bold values).

The Personality Inventory for DSM-5 Brief Form (PID-5-BF): Children Aged 11–17 Years

PID-5-BF is a 25-item self-assessment scale to assess the personality traits of 11–17-year-old children. The scale assesses five personality fields: negative affect, separation, antagonism, disinhibition, and psychoticism (21). The validity and reliability study was conducted in the Turkish language (22).

### Statistical Analysis

We evaluated our data with the Statistical Package for Social Sciences (SPSS) 22.0 package program for Windows. We expressed the variables obtained with the measurements as average $\pm$ standard deviation and the categorical variables as percentages and numbers. We used one-way ANOVA tests for the parametric cases that compared the averages of three groups and Tukey's B tests for post hoc comparisons. We used the Chi-squared or Fisher's exact test to analyze categorical variables. In univariate analysis, the bilateral relationship between each independent variable and each dependent variable was investigated. Variables that were found to be statistically significant in the univariate analysis were included in the multivariate model. We assessed

the common effect of data with a statistical difference for the NSSI and non-NSSI patient groups with a binary logistic regression analysis. Reduced final model representations are presented in cascading models. We considered a p<0.05 value as statistically significant.

### RESULTS

Sociodemographic characteristics are shown in Table 1. A total of 119 adolescents participated in this study: 22.7% (n=27) of the participants were males and 77.3% (n=92) were females. In the NSSI(+) group, 90.9% of the participants were females, and we also observed a statistically significant difference with the healthy group in terms of gender (p<0.01). The average age of the adolescents participating in this study was 15.45 years in the NSSI(+) group, 14.86 years in the NSSI(-) group, and 15.21 years in the healthy group (F: 1.366, p>0.05). The school success of the adolescents in the NSSI(+) and NSSI(-) groups was not significantly different, but it was significantly lower than that of the healthy group (p<0.05). We also found that the friendship of adolescents with NSSI was significantly worse than that in other groups (p<0.05).

**Table 3: Comparison of DERS and PID-5-BF scores**

	Mean of NSSI(+)	Mean of NSSI(-)	Mean of HC	F†	p	Post hoc
<b>DERS</b>						
Purpose	18.56	15.32	13.13	20.47	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) > HC
Strategy	18.93	14.45	12.02	25.43	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) > HC
Impulsivity	20.02	14.13	12.31	27.53	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) NSSI(+) > HC
Awareness	13.75	15.50	17.05	5.23	<b>0.007</b>	NSSI(+)<HC
Clarity	14.40	13.41	12.78	2.87	0.06	
Nonacceptance	16.60	12.24	9.00	19.31	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) > HC
Total score	102.65	84.08	76.19	23.03	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) NSSI(+) > HC
<b>PID-5-BF</b>						
Negative affect	9.40	7.32	4.07	21.46	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) > HC
Separation	8.13	6.16	4.13	16.61	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) > HC
Antagonism	4.30	2.18	2.50	6.08	<b>0.003</b>	NSSI(+) > NSSI(-) NSSI(+) > HC
Disinhibition	8.22	5.81	3.47	29.67	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) > HC
Psychoticism	8.79	4.48	2.02	62.37	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) > HC
Total score	38.90	26	16.21	51.43	<b>&lt;0.001</b>	NSSI(+) > NSSI(-) > HC

†: One-way ANOVA test; Post hoc: Tukey's B Test; DERS: Difficulties in Emotion Regulation Scale; PID-5-BF: The Personality Inventory for DSM-5 Brief Form; NSSI: Nonsuicidal self-injury; NSSI(+): NSSI patient; NSSI(-): Non-NSSI patient; HC: Healthy control. p<0.05 is significant (bold values).

**Table 4: DSM-5 diagnoses of adolescents in NSSI(+) and NSSI(-) groups**

	NSSI(+), n	NSSI(-), n	$\chi^2$	df	p
Anxiety disorders	15	26	10.525	1	<b>0.001</b>
Disruptive, impulse-control, and conduct disorders	11	0	10.704	1	<b>0.001</b>
Major depressive disorder	27	11	8.076	1	<b>0.004</b>
Attention deficit and hyperactivity disorder†	7	2	2.245	1	0.170
Posttraumatic stress disorder†	3	1	0.725	1	0.621
Obsessive-compulsive disorder†	3	4	0.406	1	0.697
Tic disorder†	1	0	0.851	1	1.000
Eating disorders†	1	1	0.015	1	1.000
Bipolar disorder†	0	1	1.204	1	0.457

†: Fisher's exact test;  $\chi^2$ : Chi-squared test; NSSI: Nonsuicidal self-injury; NSSI(+): NSSI patient; NSSI(-): Non-NSSI patient. p<0.05 is significant (bold values).

A comparison between the individual and familial factors related to NSSI for all groups is shown in Table 2. The number of smoking adolescents in the NSSI(+) group (36.4%) was significantly higher than that in other groups (p<0.001). The suicidal ideation history was significantly higher in the NSSI(+) group than in other groups (p<0.001). In terms of physical and sexual abuse, the adolescents in the NSSI(+) group reported a significantly higher abuse history than those in other groups (p<0.001 vs p=0.001). The number of adolescents with a disrupted family unit (27.3%) and reporting domestic violence (27.3%) was

significantly higher in the NSSI(+) group than in other groups (p=0.001).

The DERS and PID-5-BF scores of all groups are shown in Table 3. We found a significant difference between the groups for the subscale scores and total scores of DERS purpose, strategy, impulsivity, awareness, and nonacceptance (p<0.05). All the subscales and the total score of PID-5-BF were also significantly different between the groups (p<0.05).

DSM-5 diagnoses of adolescents in NSSI(+) and NSSI(-) patient groups are given in Table 4. When we compared the DSM-5 diagnoses of the adolescents in

**Table 5: Results of binary logistic regression analysis testing the impact of the differences found between the NSSI(+) and NSSI(-) patients on the existence of NSSI**

	<b>B</b>	<b>Wald</b>	<b>Exp(B)</b>	<b>95% CI for Exp(B)</b>	<b>p</b>
Suicidal ideation	1.432	4.72	4.188	1.150–15.246	<b>0.03</b>
PID-5-BF total score	0.116	10.863	1.123	1.048–1.203	<b>0.001</b>

Model summary: Multivariate binary logistic regression analysis. Variables: Difficulties with peer relationships, smoking, family integrity, domestic violence, exposure to physical abuse, exposure to sexual abuse, suicidal ideation, DERS total score, and PID-5-BF total score.  $\chi^2$ : 33,774; df: 2;  $p < 0.001$ ; Nagelkerke  $R^2$ : 0.50; DERS: Difficulties in Emotion Regulation Scale; PID-5-BF: The Personality Inventory for DSM-5 Brief Form.  $p < 0.05$  is significant (bold values).

the groups, we found that the adolescents in the NSSI(+) group had significantly more major depressive disorder and disruptive, impulse-control, and conduct disorders than those in the NSSI(-) group ( $p=0.004$  vs  $p=0.001$ ). We also found that the number of anxiety disorders in the NSSI(-) group was significantly higher than that of the NSSI(+) group ( $p=0.001$ ).

We assessed the collective effect of the differences found between the NSSI(+) and NSSI(-) patients on the existence of NSSI with binary logistic regression. The statistically significant difference between the dependent variable existence of NSSI and the independent variables of the NSSI(+) and NSSI(-) patients were as follows: difficulties with peer relationships, smoking, family integrity, domestic violence, exposure to physical abuse, exposure to sexual abuse, suicidal ideation history, DERS total score, and PID-5-BF total score. In this model, we determined that the existence of suicidal ideation history and a high PID-5-BF total score increased the NSSI risk in the patient group. The estimated relative risk was 4.188 ( $p < 0.05$ , 95% CI: 1.15–15.246) for suicidal ideation history and 1.123 ( $p=0.001$ , 95% CI: 1.048–1.203) for the PID-5-BF total score. Results of binary logistic regression analysis testing the impact of the differences found between the NSSI(+) and NSSI(-) patients on the existence of NSSI are shown in Table 5.

## DISCUSSION

The importance of our study comes from the fact that this study included not only healthy individuals as a control group, as did previous studies, but also adolescents with psychiatric disorders while evaluating the possible risk factors related to NSSI. Our findings revealed that patients in the NSSI group showed higher scores on the Difficulties in Emotion Regulation Scale than subjects in both NSSI(-) and healthy control groups. NSSI(+) patients also displayed increased levels of maladaptive personality traits. They experienced difficulties with peer relationships, disruption in family unity, domestic

violence, smoking, sexual and physical abuse, and suicidal ideation history among psychosocial factors.

The female gender is considered a NSSI risk factor in the literature (23). In addition to the studies that report more prevalent NSSI in females (24,25), there are studies that show no gender difference (3,13). In our study, the majority of the NSSI(+) group comprised female patients. However, this might be explained by the high number of female patients in the clinic sample when we considered the female distribution in the NSSI(-) group and the lack of significant difference between the groups.

Some studies on adolescents with NSSI showed that smoking, alcohol, and drug use are related to NSSI (10,11). Additionally, a study in Germany with a social sample found that smoking increased the NSSI risk in female adolescents by approximately 2–3 times (26). In our study, we also found statistically significant higher rates of smoking in the NSSI(+) group in comparison with other groups. Initiation of smoking and NSSI may share the same risk factors. Again, smoking may be used to provide self-treatment for NSSI as in some other psychiatric diseases (27). However, we did not find any significant difference in alcohol and drug use between the NSSI(+) and other groups. This might be due to the low prevalence of patients with alcohol and drug use disorder in our clinic since an addiction unit is not present in our clinic.

Long-term follow-up studies state that NSSI is a prognostic factor for suicide attempts (28,29). It is emphasized in the NICE guideline that children and adolescents with NSSI should first be evaluated in terms of suicide risk (30). Many studies found a strong relationship between NSSI and suicide attempts (5), which are facilitated in individuals with NSSI by getting used to self-created violence and pain (12). In our study, the history of suicidal ideation was related to NSSI. Similarly, some studies reported that suicidal ideation might be a predictor of NSSI (31,32). When evaluated together with all the factors found to be associated with NSSI in our study, we also found that suicidal ideation history was 4 times more associated with NSSI.

As mentioned in various publications, physical, sexual, and emotional abuse are the most known risk factors for NSSI (7–9,11,23). In our study, we also found that physical and sexual abuse were related to NSSI. Previous studies found that the perception of insufficient support from the family, school, and friends was related to NSSI (23). Additionally, a study with 99 female adolescents admitted to a psychiatry unit determined that difficulties in friendship increased the prevalence of self-injury and violence (33). Our study supports this finding as we found that adolescents with NSSI perceived friendship in a more negative way. Likewise, our findings supported the studies showing that domestic violence and disruptions in family unity were NSSI-related risk factors (23).

Several studies reported that childhood traumas such as physical, sexual, and emotional abuse and difficulties with peer relationships disrupt the ability to regulate emotions and have an impact on NSSI development (33–35). One of the functions of NSSI is emotional regulation (4,11,34). A review study reported that the emotional intensity of individuals might be managed with behaviors such as NSSI, which might help to decrease the emotional intensity but with harmful results (11). Theoretical and experimental studies defined self-injurious behaviors as a result of a weak emotional regulation (36) and a maladaptive strategy to regulate the affect (11,37). In our study, we found that adolescents in the NSSI group showed statistically higher scores on the difficulties in emotion regulation scale, supporting that they had more difficulty in emotion regulation compared with other groups. Similar to the results of a recent meta-analysis highlighting the subscales with which NSSI is most strongly associated (38), adolescents with NSSI showed low-level skills to accept negative emotions, initiated a behavior toward purpose when experiencing a negative emotion, and used effective strategies to regulate emotion and control impulsive behaviors in our study.

Impulsivity is defined as a risk factor for NSSI (11,23). According to the Theory of Urgency, some individuals have a higher chance to act urgently when they experience an increased negative affection (39), and their impulsive behaviors might provide a short-term elimination of the negative affect (40). Therefore, impulsivity (negative urgency) might increase the vulnerability of individuals to develop NSSI, which is an easily accessible but maladaptive behavior (39). Disinhibition is related to impulsivity, which is defined as a negative urgency and a lack of premeditation. It is

among the five basic high-level properties of alternative dimensionality personal pathology in the DSM-5 (i.e., negative affect, disinhibition, antagonism, separation, and psychoticism) (41). Evidence shows a strong relationship between these maladaptive personality traits, suicide, and NSSI (42–44). Our findings found a relationship between NSSI and each of the five basic high-level properties of the DSM-5 personality pathology model. These traits must be significantly different between healthy adolescents and non-NSSI adolescents with a mental disorder. A study investigating the relationship between NSSI and personality traits found that NSSI was specifically related to negative affect, disinhibition, and antagonism traits, which supports our findings (45–47). Longitudinal studies on adolescents with NSSI reported that NSSI is a predictor of borderline personality disorders (48–51). On the other hand, a 5-year long prospective study by Homan et al. (52) did not find a predictive relationship between NSSI and adult borderline personality disorders. Another study performed on adults with borderline personality disorders found that 50%–78% of the patients had NSSI. Interestingly, the patients' symptoms generally dated back to late childhood and adolescence, which was probably when the maladaptive personality traits developed (53). Our findings showed that the existence of maladaptive personality traits was 1.123 times more associated with NSSI. The existing literature and our findings suggest that NSSI might be important to detect adolescents with maladaptive personal traits and allow early intervention. Considering the relatively limited number of studies investigating the relationship between personality traits and NSSI, more studies are needed before making any conclusion about the relationship between maladaptive personality traits in adolescence and NSSI.

This study has some limitations. Because of a relatively small sample size, our findings are not generalizable to all adolescents with NSSI. Heterogeneity of the study sample due to the inclusion of adolescents with different diagnoses may limit our understanding of NSSI. Several risk factors for NSSI might also increase the risk for other mental disorders. Although some of our results were different between NSSI patients and healthy adolescents, they did not reveal any difference between NSSI and non-NSSI patients. We believe that this might be due to the presence of common risk factors for NSSI and other mental disorders. The nonstructured evaluation of NSSI may be inherently subjective. The majority of

the previous studies compared NSSI patients with healthy controls. To better understand the NSSI-related factors, more studies with larger samples are needed to compare both NSSI and non-NSSI patients with similar diagnoses with healthy controls.

## CONCLUSION

Our study found that difficulties with friendship, smoking, and sexual and physical abuse are related to NSSI. We also found that a suicidal ideation history increases NSSI risk. This finding supports several studies reporting that suicidal ideation might be a predictor of NSSI. Our data showed that adolescents with NSSI experienced difficulties in emotion regulation. Our study found that NSSI was separately related to the five basic high-level traits in the alternative dimensional personality pathology model DSM-5 and that the existence of these maladaptive personality traits increased the NSSI risk. The existing literature and our findings suggest that previous suicidal ideation and maladaptive personality traits might be suggestive of NSSI. Considering these potential risk factors would allow clinicians to develop more suitable early intervention, follow-up, and treatment strategies for NSSI in the adolescent population. Further research is necessary to conclude that maladaptive personality traits in adolescents are related to NSSI.

Contribution Categories		Author Initials
Category 1	Concept/Design	T.C., S.Y.S.
	Data acquisition	E.A.B., A.D.U.C.
	Data analysis/Interpretation	O.B., H.K.
Category 2	Drafting manuscript	T.C., S.Y.S., E.A.B., A.D.U.C.
	Critical revision of manuscript	O.B., H.K.
Category 3	Final approval and accountability	T.C., S.Y.S., E.A.B., A.D.U.C., O.B., H.K.

**Ethical Approval:** The Manisa Celal Bayar University Faculty of Medicine Health Science Ethics Committee granted approval for this study (date: 12.09.2018, number: 20.478.486).

**Informed Consent:** Written consent was collected from both the adolescents and their parents who have accepted to participate in the study.

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