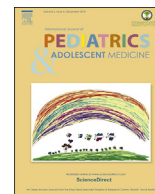


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International Journal of Pediatrics and Adolescent Medicine

journal homepage: <http://www.elsevier.com/locate/ijpam>

Original article

Nonsuicidal self-injury among adolescents in south-east Serbia

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ARTICLE INFO

Article history:

Received 27 November 2018

Accepted 13 June 2019

Available online 4 July 2019

Keywords:

Nonsuicidal self-injury (NSSI)

Adolescents

Behavioral and functional correlates of self-injury

ABSTRACT

Background: Nonsuicidal self-injury (NSSI) refers to the deliberate, self-inflicted destruction of body tissue without suicidal intent and for purposes not socially sanctioned. The aim of this study was to explore the variety of self-injury behaviors as well as the function of NSSI among adolescents in South-East Serbia.

Methods: The study included 50 adolescents of both sexes, aged 13–18 years, who had deliberately engaged in self-injury at least once. A general socio-demographic questionnaire and the Inventory of Statements About Self-Injury (ISAS) were used in the study.

Results: The average age of the respondents was 15 (1.17); the most common NSSI methods were cutting (60%), followed by biting and severe scratching (14%); the average age of onset was 14.12 (0.77); the majority confirmed experiencing pain during self-injury (42%); the respondents more commonly performed NSSI when they were alone (68.0%); in 90% of the cases, the time elapsed between sensing the urge to self-injury and acting on it was less than 1 h; the majority of the respondents stated that they did not want to stop self-injuring (56%). In terms of the NSSI function, the obtained scores were the highest for affect regulation 3.36 (1.47), self-punishment 1.90 (1.39) and marking distress 1.72 (1.26). In terms of gender, there was a statistically significant difference for the antidissociation ($P = .043$), interpersonal influence ($P = .004$) and revenge ($P = .019$).

Conclusion: The results may have practical implications when it comes to taking preventive and therapeutic measures in the vulnerable adolescent population.

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1. Background

Nonsuicidal self-injury (NSSI) refers to the deliberate, self-inflicted destruction of body tissue without suicidal intent and for purposes not socially sanctioned, including cutting, burning, biting, and scratching skin [1]. An important feature of NSSI is the repeated infliction of surface, yet painful, injuries to the surface of one's own body. This behavior differs from socially acceptable physical changes such as piercing or tattooing and is not part of religious or

cultural rituals [2]. NSSI has been shown to be a common phenomenon in adolescents both in clinical and community samples. The incidence and prevalence of self-injury are mainly unreliable because self-injury is inflicted in secret or is not clearly recognizable. In general population, only 10%–15% of adolescents who engage in self-injury seek help in hospitals, which indicates that there is a large number of unrecorded cases of adolescents with mental disorders, including serious psychiatric disorders [3–5]. In the clinical population of adolescents, self-injury is more common in comparison with the general population and is often in comorbidity with borderline personality organization, depressive or anxiety disorders (PTSD), eating disorders, and psychoactive substance abuse [5]. NSSI may also be present without any psychiatric comorbidities [6].

NSSI has various manifestations and presentations, from clear and unequivocal psychopathology to developmental manifestations that may resemble certain mental disorders, but are transient and without lasting consequences. Motivation for NSSI as well as its

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Peer review under responsibility of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia.

function is extremely individual. Self-injuring can be sporadic, impulsive, or repetitive and serve as a coping strategy for immediate relief of the accumulated intense negative feelings such as anxiety, depression, emotional distress, and feeling of failure or dissatisfaction. It can also take on a ritual or compulsive character. There is evidence that NSSI has several functions that are not mutually exclusive. Adolescents who engage in self-injury can also be classified according to the function of NSSI. These functions can change and overlap over time and serve to express different aspects of the same events. Klonsky carried out a comprehensive review of theoretical views on the functions of NSSI and research to date in the field. Seven main categories of NSSI functions were derived from this review: affect regulation, self-punishment, antidissociation, interpersonal influence, interpersonal boundaries, sensation-seeking, and antisuicide [7].

The most important difference between nonsuicidal and suicidal self-injury is the suicidal intent. Although suicide is not the intention of self-injury, their connection is complex, because self-injury can potentially endanger the person's life. The results of prior studies conducted among adolescents in clinical setting suggested that up to 70% of those with the history of NSSI reported having at least one suicidal attempt and that NSSI is one of the predictors of suicidal behavior [8,9]. Thus, it is necessary to understand the motivation, meaning, and effect of this form of behavior as clearly as possible and assess the suicidal intent in each adolescent who manifests it.

To the authors' knowledge, there have been no studies of behavioral and functional correlates of NSSI in adolescents in our surrounding. Hence, we decided to examine these aspects of NSSI in adolescents, which could contribute to a better understanding and planning of activities aimed at prevention and therapeutic measures in this vulnerable adolescent population.

Aim: The aim of this study was to explore a variety of non-suicidal self-injury as well as the function of NSSI among adolescents in South-East Serbia. We also explored the descriptive and contextual factors related to self-injury, including the age of onset, the experience of pain during NSSI, whether NSSI is performed in the presence of others or alone, the time between the urge to self-injure and the act itself, and whether the individual wants to stop self-injuring.

2. Subject and method

The study included 50 adolescents of both sexes, aged 13–18 years, who were consecutively reported to the Department for Child and Adolescent Psychiatry during December 2016–January 2018. All respondents had deliberately engaged in self-injury at least once, which had been confirmed by an objective medical examination as well as medical anamnesis. The study did not include adolescents with a diagnosis of psychotic disorders, acute and chronic organ diseases, and reduced intellectual abilities (below the age of 70 years). All respondents had given their consent to participate in the study, and their parents/guardians had been informed about the purpose of the study. In addition to the medical examination and assessment, a general socio-demographic questionnaire, a structured clinical interview for DSM IV disorders, and the Inventory of Statements About Self-Injury (ISAS) were used in the study [10]. The first section of the ISAS assesses the lifetime frequency of nonsuicidal self-injury performed “intentionally and without suicidal intent.” This may be in the form of banging/hitting self, biting, burning, carving, cutting, wound picking, needle-sticking, pinching, hair pulling, rubbing skin against rough surfaces, severe scratching, or swallowing chemicals. Five additional questions assess descriptive and contextual factors related to self-injury; the last four questions have a multiple-choice format.

The second section assesses 13 potential functions of NSSI: affect regulation, antidissociation, antisuicide, marking distress, self-punishment, autonomy, interpersonal boundaries, interpersonal influence, peer bonding, revenge, self-care, sensation seeking, and toughness. Each subscale is assessed with three items rated on a scale from 0 = *not at all relevant* to 2 = *very relevant* to one's experience of NSSI, which means that the results for each of the 13 functions may vary from 0 to 6. For the purpose of this study, the ISAS was translated into Serbian and back into English by a professional translator fluent in both languages.

The data are presented in the form of an arithmetic mean and standard deviation, either in the form of absolute and relative numbers. The Mann-Whitney *U* test was used for comparing the continuous variables. The Chi-squared test and the Fisher test (frequency > 5) were used for comparing categorical variables. The hypothesis was tested with α ; the significance threshold was chosen to be 0.05 ($p < .05$). Statistical data analysis was performed in the R environment [11].

3. Results

The study included 50 respondents: 15 males (30%) and 35 females (70%). The average age of the respondents was 15 (1.17) (min. 13 years and max. 18 years of age). The most common NSSI methods were cutting (60%), followed by biting and severe scratching (14% each) (Table 1). In terms of gender, there was a similar distribution of the NSSI methods: they were even ($P = .208$) (Table 1).

The average age of onset was 14.12 (0.77). A total of 42% of patients confirmed experiencing pain during NSSI, 30% stated that they sometimes experienced it, whereas 28% denied experiencing pain during NSSI. About 68% of the respondents performed NSSI when they were alone, that is 66.7% of males and 68.6% of females. About 44% of the total population was included in the study, that is 33.3% of males and 48.6% of females, whereas 56% of the total number of respondents stated that they did not want to stop self-injuring. In 90%, the time which elapsed between sensing the urge for self-injury and acting on it was less than 1 h. The results showed that responses were consistent in terms of gender (Table 2).

In terms of NSSI function, among the clinical population included in the study, the highest score was for affect regulation 3.36 (1.47), self-punishment 1.90 (1.39), and marking distress 1.72 (1.26) (Table 3). Among male respondents, the highest scores were for affect regulation 2.80 (1.61), marking distress 1.80 (1.37), and self-punishment 1.60 (1.68) (Table 3). The highest scores among female respondents were for affect regulation 3.60 (1.37), self-punishment 2.03 (1.25), and marking distress 1.69 (1.23) (Table 3). In terms of gender, the results showed a statistically significant difference in the following subscales: antidissociation ($P = .043$), interpersonal influence ($P = .004$), and revenge ($P = .019$) (Table 3).

4. Discussion

The average respondent's age was 15 (1.17), with the average age of onset 14.12 (0.77). There were more female than male respondents. Although some studies indicate that NSSI is more frequent in girls than boys [12], others indicate that there are no consistent gender differences [13]. Our study showed that the most common form of NSSI was cutting, followed by biting and severe scratching. In terms of the most common methods of NSSI, our results are consistent with the literature [14,15]. The literature agrees on the gender differences regarding the NSSI method. According to Health et al. “specifically, males are more likely to self-hit, and females are more likely to cut” [16]. Our study, however,

Table 1
Type of nonsuicidal self-injury.

Type of Nonsuicidal self-injury	Total		Male		Female		P value ^a
	Number	%	Number	%	Number	%	
Cutting	30	60.0	8	53.3	22	62.9	.208
Biting	7	14.0	1	6.7	6	17.1	
Burning	2	4.0	2	13.3	0	0	
Carving	3	6.0	1	6.7	2	5.7	
Severe scratching	7	14.0	3	20.0	4	11.4	
Swallowing dangerous substances	1	2.0	0	0	1	2.9	

^a Chi-squared test.**Table 2**
Descriptive and contextual factor of NSSI in the total examined population and by gender.

Questions	Total		Male		Female		P value ^a
	Number	%	Number	%	Number	%	
At what age did you first harm yourself?	14.12 ± 0.77		14.20 ± 0.67		14.09 ± 0.82		.611 ^b
Do you experience physical pain during self-harm?							
No	14	28.0	5	33.3	9	25.7	.709
Yes	21	42.0	5	33.3	16	45.7	
Sometimes	15	30.0	5	33.3	10	28.6	
When you self-harm, are you alone?							
No	9	18.0	4	26.7	5	14.3	.410
Yes	34	68.0	10	66.7	24	68.6	
Sometimes	7	14.0	1	6.7	6	17.1	
How much time elapses from the time you have the urge to self-harm until you act on the urge?							
<1h	45	90.0	15	100.0	30	85.7	.305 ^c
1–3 h	5	10.0	0	0	5	14.3	
Do/did you want to stop self-harming							
No	28	56.0	10	66.7	18	51.4	.494
Yes	22	44.0	5	33.3	17	48.6	

^a Chi-square test.^b t-test.^c Fisher test.**Table 3**
Structure of ISAS function measured by the ISAS according to gender.

Functions Scales	Total	Male	Female	P ^a
Affect regulation	3.36 (1.47)	2.80 (1.61)	3.60 (1.35)	.024
Interpersonal boundaries	0.60 (1.03)	0.60 (0.98)	0.60 (1.06)	.768
Self-punishment	1.90 (1.39)	1.60 (1.68)	2.03 (1.25)	.160
Self-care	0.84 (0.87)	1.07 (0.96)	0.74 (0.82)	.235
Antidissociation	1.04 (1.14)	0.53 (0.74)	1.26 (1.22)	.043
Antisuiicide	0.84 (1.18)	0.87 (1.06)	0.83 (1.25)	.508
Sensation-seeking	0.30 (0.68)	0.47 (0.74)	0.23 (0.64)	.137
Peer-bonding	0.44 (0.91)	0.33 (0.72)	0.49 (0.98)	.737
Interpersonal influence	1.38 (0.94)	0.80 (0.68)	1.63 (0.94)	.004
Toughness	0.64 (0.88)	0.73 (1.10)	0.60 (0.77)	.991
Marking distress	1.72 (1.26)	1.80 (1.37)	1.69 (1.23)	.827
Revenge	0.86 (1.28)	0.20 (0.56)	1.14 (1.40)	.019
Autonomy	0.46 (0.91)	0.53 (0.92)	0.43 (0.92)	.500

^a Mann-Whitney test.

showed no differences in NSSI method between the two genders.

Non-suicidal self-injury often is thought to be associated with impulse control problems. Results of a meta-analysis revealed that individuals who engaged in NSSI self-reported greater impulsivity than individuals who did not engage in NSSI, and this effect was most consistent for measures of negative urgency [17]. It is possible that some individuals, in the presence of heightened negative affect, are more likely to act rashly [18]. Hence, impulsivity (negative urgency) may increase an individual's vulnerability to engage in a readily accessible, though, maladaptive behavior, such as self-harm, to moderate affect [18]. Adolescents who inflict self-injury often take some time, as they sense the urge to self-harm until they act upon it [19]. The results of our research show that in the

majority of cases, this urge emerges less than an hour beforehand. Some research shows that adolescents who injure themselves commonly report feeling minimal or no pain [20]. Our study also showed that more respondents reported feeling pain during self-injury in comparison to the ones who reported feeling minimal or no pain. Once it starts, self-injury seems to acquire some characteristics of addictive behavior [21]. Hence, it can be very difficult for the person to stop it. Our results showed that a higher percentage of respondents engage in self-injury when they are alone and that a higher percentage of respondents did not want to stop self-injuring. With some adolescents, NSSI is repetitive and long-lasting, as it serves as a means of coping with unpleasant feelings and situations and is performed as an affect regulation strategy. Therefore, it is more difficult for them to stop it. In such cases, there is often a set of dysfunctional circumstances – emotional vulnerability, ineffective affect regulation, as well an emotionally inadequate environment. By inhibiting feelings that are more frequently negative, the adolescent creates the state of emotional “numbness”, which they often experience as a feeling of emptiness and loneliness. This contributes to the vicious circle of further emotional avoidance and inhibits functional affect regulation [22].

The literature states that affect regulation – using NSSI to alleviate intense negative emotions – is the most common function of NSSI, endorsed by more than 90% of those who engage in the behavior [7,23,24]. Our results are consistent with the literature, as the majority of participants had found statements such as “Reducing anxiety, frustration, and anger,” “Realizing emotional pressure that has built up inside of me,” or “Calming myself down” to be very relevant.

Affect regulation has been discussed in terms of both internal

and social reinforcement, which can be negative and positive [25]. Firstly, NSSI is either intra-personal, automatically reinforcing (e.g., to obtain a reduction in tension or create a more desirable state), or socially reinforcing (e.g., to alter one's environment). Secondly, NSSI is reinforced in either a positive (i.e., rewarded with a positive stimulus) or negative manner (i.e., rewarded by escaping a negative interpersonal demand) [25]. Adolescents who report engaging in NSSI behavior for reasons related to internal positive or negative reinforcement are more likely to be "at risk" for comorbid psychiatric impairments [26] as well as risk of suicide [27].

The research showed differences in the function of self-injury between female and male respondents. Compared to the male respondents, the function of self-hurting in females was rather antidissociation, ("Trying to feel something even if it's psychiatric pain"), interpersonal influence ("Letting others know the extent of my emotional pain"), and revenge ("Getting back at someone").

A study by Rodav et al. [28] found that the most common functions self-injury are internal emotional regulation, external emotional regulation, social influence, and sensation seeking. Moreover, in the same research, the NSSI group reported significantly higher levels of depression, impulsivity, and suicidal ideations [28]. Antisucide function of self-injury ("Avoiding the impulse to attempt suicide") was also present among adolescents in our study. Some authors [29] state that self-injury is very different from suicide, and that the basic difference lies in the fact that "a person who really tries to commit suicide wants to break free from all feelings, whereas a person who self-harms wants to feel better." Other research, however, found a number of similarities between NSSI and suicidal behavior in terms of certain risk factors and function [30,31]. Due to the potential rapid and unpredictable changes in motivation and methods of self-injuries, it is very demanding to monitor the condition and functioning of adolescents who engage in this form of. It should not be disregarded that there is a risk for fatal outcome, whether impulsive (acting-out) or due to incorrect assessment of the consequences of self-injury (suicide by "accident").

5. Conclusion

Using the Inventory of Statements About Self-Injury (ISAS), the results of this study suggested a greater representation of some forms of self-injury and their functions among adolescents in South-East Serbia, including the accompanying contextual and descriptive factors. It would be of great significance to examine this in adolescents in other regions to obtain data at the national level and compare them with the results in other regions. In addition to the mental health assessment, which includes the assessment of chronicity, frequency, and function of NSSI, suicidality, comorbid mental disorders, as well as familial and extra-familial influence, it has also been shown that the Inventory of Statements About Self-Injury (ISAS), along with functional scores on some dimensions, can effectively isolate those adolescents who are at the highest risk. With regard to the extent, trends and consequences of NSSI, the results point to practical implications when it comes to taking therapeutic measures in the vulnerable adolescent population.

Conflict of interest

The authors have nothing to disclose related to this work. This work did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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