

Non-suicidal self-injurious behavior in forensic child and adolescent populations

Clinical features and relationship with depression

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ABSTRACT

الأهداف: تقييم حالات إيذاء الذات لدى الأطفال والمراهقين الذين تم إحضارهم لفحص الطب الشرعي لتحديد عوامل الخطر لهذا السلوك وعلاقته المحتملة بالاكْتئاب.

الطريقة: تتألف هذه الدراسة من 295 من الأطفال والمراهقين الذين جلبوا للفحص القضائي في وزارة العدل قسم علوم الطب الشرعي، ومجلس الطب الشرعي، أنقرة، تركيا من مايو إلى أكتوبر 2013م. تم جمع المعلومات حول الخصائص الاجتماعية والديموغرافية وتعاطي الكحول والمخدرات، وتاريخ الاعتداء الجنسي، ومحاولات الانتحار وسلوك إيذاء النفس من خلال مقابلة شبه منظمة. تم تقييم إيذاء الذات الغير انتحاري أثناء الفحوص الطبية الشرعية. تم تقييم أعراض الاكْتئاب من خلال مقياس بيك للاكْتئاب.

النتائج: وجد أن نسبة إيذاء الذات الغير انتحاري لدى الذكور 20.2% ولدى الإناث 30.6%. تم العثور على فروق ذات دلالة إحصائية لدى مجموعة السلوك المضر بالنفس من ناحية عدد الأطفال في الأسرة، طلاق الوالدين، والعمل خارج المدرسة، والاعتداء الجنسي، وتعاطي المخدرات، ومحاولات الانتحار و الضلوع في الجريمة. كانت علامات مقياس بيك للاكْتئاب أعلى لدى مجموعة إيذاء الذات ($p < 0.001$).

الخلاصة: أظهرت نتائج هذه الدراسة أن الأطفال والمراهقين الذين قاموا بإيذاء أنفسهم لديهم مشكلات حياتية متعددة. كما ظهرت علامات الاكْتئاب بشكل أكبر لدى من قاموا بإيذاء أنفسهم، الخصائص المحددة لهذه السلوكيات تحتاج إلى مزيد من التحقيق.

Objective: To investigate risk factors for non-suicidal self-injury (NSSI), and present the relationship between NSSI and depression in children and adolescents who appeared for forensic examination.

Methods: This study consisted of 295 children and adolescents who were brought for judicial examination in the TR Ministry of Justice Forensic

Science Department, Council of Forensic Medicine, Ankara, Turkey between May and October 2013. Sociodemographic factors, alcohol and substance abuse, and history of sexual abuse and suicide attempts were assessed using a semi-structured questionnaire. During forensic medical examinations, NSSI was evaluated. Depression was assessed using the Beck Depression Inventory.

Results: The frequency of NSSI was 20.2% among boys, and 30.6% among girls. Statistical differences were found between subjects with and without NSSI in terms of number of children in their families, whether or not their parents were divorced, whether they held part-time jobs, or had a history of sexual abuse, substance abuse, or suicide attempts, and the number of criminal involvements. Those with NSSI had higher depressive scores than others ($p < 0.001$).

Conclusion: Children and adolescents with NSSI have wide-ranging problems in their lives. In a forensic adolescent population, depressive symptoms are more common in individuals with NSSI behaviors, and the specific characteristics of these behaviors need further investigation.

Neurosciences 2015; Vol. 20 (1): 31-36

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Received 6th May 2014. Accepted 28th October 2014.

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Disclosure. The authors declare no conflicting interests, support or funding from any drug company.

Non-suicidal self-injury (NSSI) is deliberate, direct destruction or alteration of body tissue without intention of suicide that is unacceptable to society.¹ Numerous terms, including self-mutilation, self-injury, and self-harm have been used in the literature to describe NSSI. Self-mutilation and self-injury are usually synonymous and defined as directly harmful attempts against the body. Today, self-injury and NSSI are preferred over self-mutilation. Self-harm is used to define indirect harmful attempts including alcohol and drug use, reckless driving, and so forth.² Non-suicidal self-injury is applied primarily to convert intensive painful moods including sorrow, guilt, flashbacks, and depersonalization, to physical pain. Other reasons include self-punishment, attention-getting, imposing guilt, and adapting to friends with NSSI.³ Favazza⁴ divided self-injury behavior into 4 main categories: major, stereotypical, compulsive, and impulsive. Although the first 3 are often encountered in populations, the prevalence of compulsive and impulsive behaviors is rising. Cutting, carving, scraping, and burning the skin and subdermal tissue, wringing, pulling, or bruising the skin and hair or both is included in NSSI.⁵ Studies suggest that self-injury behavior generally occurs during mid- or late adolescence and progressively decreases after early adulthood. Some studies report NSSI is found primarily in females,^{3,4,6} but others suggest no gender difference.^{7,8} This discrepancy may be a result of study methods. For example, burning and self-hitting behaviors were found to be more common in males, cutting and scratching behaviors were found more common in females.⁹ Various studies based on community and clinical inpatient samples suggest that prevalence of NSSI varies between 13-45% among adolescents.^{10,11} In a study using high school students in Turkey, self-injury behavior prevalence was estimated at 21.4%.¹² Non-suicidal self-injury is a common finding in psychiatric and forensic examinations. Studies demonstrate that numerous psychiatric disorders including depressive, anxiety, and behavioral disorders, drug abuse, dissociative, borderline, and antisocial personality disorders, stress and violence, and abuse are frequently encountered with NSSI.¹³⁻¹⁵ Additionally, NSSI is reportedly more frequent among criminal adolescents.¹⁶ Studies examining factors associated with NSSI are limited. We found few studies that investigated the relationship between depression level and NSSI in forensic child and adolescent groups in Turkey, and results were contradictory. Therefore, this study was aimed at determining psychosocial factors and risk factors for NSSI and its association with depression levels among children and adolescents

referred for forensic examinations. We hypothesize that NSSI incidents will be frequent among forensic child and adolescent populations, and NSSI will correlate with risk factors including sociodemographic properties and depression.

Methods. Our cross-sectional study aimed at determining psychosocial factors and risk factors for NSSI and its association with depressive symptoms in forensic child and adolescent referrals. It was conducted in the TR Ministry of Justice Forensic Science Department, Council of Forensic Medicine, Ankara, Turkey between May to October 2013. The subjects of this study were children, and adolescents aged 10 to 18 years who were referred for forensic examinations. The Education and Scientific Research Commission of Forensic Medicine Institute approved the study. Informed consent was obtained from either parents or legal guardians after the standard information regarding the study was conveyed.

Over the 6-month period, 295 child and adolescent outpatient forensic referrals were examined by a psychiatrist and forensic specialist. All patients with NSSI were identified in this examination. All participants were asked to complete a semi-structured study form prepared by the authors as well as the Beck Depression Inventory (BDI). The semi-structured study form included 27 items designed to collect participant age, gender, educational status, family characteristics (number of siblings, family income, and health status of parents), reason for forensic referral, history of physical, emotional, or sexual abuse, suicide attempts, history of substance use, and information regarding region, cause, and number of NSSI behaviors during the participant's life. For this study, NSSI was defined as deliberate, direct destruction or alteration of body tissue without intention of suicide,¹ and included such behaviors as cutting, slashing, or burning body areas. A suicide attempt was defined as any behavior intended to end the life of the participant and included such behaviors as overdose, hanging, cutting of the arms, and jumping from a height.

The BDI was used to determine the depression level of the participant. It is a self-reported measure developed by Beck et al in 1961¹⁷ to detect depression risk and measure the levels and amplitudes of the signs of depression. It comprises 21 Likert-based statements with increasing negativity. Each item is scored from 0 to 3, allowing a maximum point total of 63. The total is used as an indicator of the presence and severity of depression: totals below 10 indicate no depression, between 10 and 17 indicate mild depression, between

18 and 29 indicate moderate to severe depression, and above 30 indicate severe depression. A Turkish validity and reliability examination was performed by Hisli,¹⁸ and a cut-off was determined at 17. The Turkish version of the BDI had a Cronbach alpha of 0.74 and a split half reliability score of 0.80.

Statistical analysis. Data are shown as either percentage or mean +/- standard deviation. Differences between groups were calculated using the Student t test for continuous variables and chi-square and Fisher exact tests for discrete variables. All data were processed using the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 15.0, and $p < 0.05$ was considered significant.

Results. Of the 295 participants, 223 (75.6%) were boys. The mean age was 14.27 ± 1.05 years, and 240 (81.4%) were secondary or high school students. Additionally, 62 (21%) were working during non-school hours, and 140 (47.5%) were from families earning wages equal to or below minimum wage. Almost half (143, 48.5%) had 4 or more siblings (Table 1). The reason for referral was often assault, threat and insult, theft, sexual abuse, or motor vehicle accident. A

Table 1 - Sociodemographic characteristics of Turkish children and adolescents undergoing judicial examination (N=295).

Variables	Boys (n=223)	Girls (n=72)	Total n (%)
<i>Age</i>			
≤12 years	12	-	12 (4.1)
13-15 years	198	69	267 (90.5)
16-18 years	13	3	16 (5.5)
<i>Education level</i>			
Literate (finished elementary school)	15	4	19 (6.4)
Primary school	23	13	36 (12.2)
Secondary-High school	185	55	240 (81.4)
<i>Number of siblings</i>			
1	11	2	13 (5.7)
2-3	101	38	139 (47.1)
≥4	111	32	143 (48.5)
<i>Family income</i>			
Below minimum wage	42	12	54 (18.3)
Minimum wage	67	19	86 (29.2)
Above minimum wage	114	41	155 (52.5)
<i>Health status of parents</i>			
Both parents alive	180	55	235 (79.7)
Loss of one parent	14	1	15 (5.1)
Loss of both parents	10	2	12 (4.1)
Parents divorced	19	14	33 (11.2)
<i>Employed during non-school hours</i>			
No	173	60	233 (79.0)
Yes	50	12	62 (21.0)

Table 2 - Reasons for forensic examination referral among Turkish children and adolescents (N=295).

Reasons	Boys (n=223)	Girls (n=72)	Total n (%)
Violence (assault, threat, insult, etc.)	159	65	224 (75.9)
Theft	34	5	39 (13.2)
Sexual assault	22	-	22 (7.4)
Substance use	-	1	1 (0.3)
Arranging forged documents for school	2	-	2 (0.6)
Motor vehicle accident	4	-	4 (1.3)
Child kidnapping	1	-	1 (0.3)
Damage to public property	1	1	2 (0.6)

Table 3 - Frequency of cigarette, alcohol, and substance use of all cases referred to forensic examination among Turkish children and adolescents (N=295).

Reasons	Boys (n=223)	Girls (n=72)	Total n (%)
None	146	53	199 (67.5)
Cigarette	56	9	65 (22.0)
Alcohol	5	1	6 (2.0)
Substance use	16	9	25 (8.5)

few were referred for crimes including pick pocketing, extortion, damage to public property, possession of firearms, substance use, child kidnapping, and arranging forged documents for school (Table 2). Most participants did not smoke or use alcohol or drugs, while 22% only smoked, 2% used alcohol, and 8.5% used at least one substance (marijuana, cocaine, toluene, heroin, LSD, and so forth) in addition to smoking and alcohol use (Table 3). Of those addicted to a substance, most started using by age 15 (94, 98%). The reason for onset was curiosity (53, 51%), another addicted family member (8, 7.7%), or a friend's advice (43, 41.35%). Non-suicide self-injury was detected in 67 (22.7%) of the participants. Findings associated with NSSI were detected in 45 (20.2%) boys and 22 (30.6%) girls. The mean age was 14.14 ± 1.02 years for those with NSSI, and 14.72 ± 1.06 years for those without ($p < 0.001$). Of those with NSSI, 53 (79.1%) were aged 14-15, 52 (77.6%) were secondary or high school students, and 44 (65.7%) had 4 or more or more siblings. Self-injury behavior was seen in 44 (65.7%) participants who had 4 or more siblings, while only 23 (34.3%) had 2 or 3 siblings. None of 13 cases with no brother or sister had cutting scars. Parental divorce rate was significantly higher among those with NSSI than those without it (Table 4). The rate of involvement with multiple crimes was significantly higher among the NSSI group than the non-NSSI group. Sexual abuse and substance use rates were higher among the NSSI group. A suicide history

Table 4 - Sociodemographic characteristics of the NSSI and non-NSSI groups among Turkish children and adolescents undergoing judicial examination (N=295).

Sociodemographic characteristics	NSSI (n=67)		Non-NSSI (n=228)		X ²	P
	n	(%)	n	(%)		
Age (years ± SD)	14.14 ± 1.02		14.72 ± 1.06		t=-4.001	<0.001
Gender					3.34	0.068
Boys	22	(30.6)	50	(69.4)		
Girls	45	(20.2)	178	(79.8)		
Education level					0.83	0.67
Literate	5	(7.5)	14	(6.1)		
Primary School	10	(14.9)	26	(11.4)		
Secondary-High	52	(77.6)	188	(82.5)		
Income level					2.61	0.27
Low	16	(23.9)	38	(16.7)		
Average	21	(31.3)	65	(28.5)		
High	30	(44.8)	125	(54.8)		
Working					5.57	0.018
Yes	21	(31.3)	41	(18.0)		
No	46	(68.7)	187	(82.0)		
Number of siblings					12.11	0.002
1	-	-	13	(5.7)		
2-3	23	(34.3)	116	(50.9)		
≥4	44	(65.7)	99	(43.4)		
Health status of parents					14.96	0.002
Parents alive	47	(70.1)	188	(82.9)		
Loss of one parent	3	(4.5)	11	(4.8)		
Loss of both parent	1	(1.5)	11	(4.8)		
Parents divorced	16	(23.9)	17	(7.5)		

NSSI - Non-suicidal self-injury

existed in 11.9% in the NSSI group, but none in the non-NSSI group ($p<0.001$). Of the NSSI group, 41.8% had BDI scores totaling 17 or greater, while 18.9% of the non-NSSI group did so ($p<0.001$, Table 5).

Discussion. This study was important for determining the sociodemographic characteristics of the children and adolescents with NSSI, risk factors for NSSI, and the association between NSSI and depression levels in children and adolescents referred for forensic examination in Turkey. Our incidence rate of 22.7% agrees with other studies, which report a 13-45% lifetime prevalence of NSSI in adolescence in the general population.^{10,11} Although most of the previous studies reported NSSI prevalence to be the same for both genders,¹⁹ our findings support the studies demonstrating predominance among females.²⁰ An adolescent onset is generally seen among both

genders,²¹ and frequently has an onset at 14-15 years of age, and despite the risk of persistence in adulthood, it tends to decrease at age 18.²² Similar to the literature, most of our patients were in the age range of 14 to 15 years.

We found a significant difference between the NSSI and non-NSSI groups in parental divorce rates, number of children in the family, employment during non-school hours, and involvement in multiple crimes. Parental divorce rates, number of children in the family, and number of referrals to forensic examination were higher among the NSSI group. These findings suggest that insufficient family support may be a risk factor for NSSI. Wolff et al²³ reported that compared with friend or teacher support, family support was found to be more negatively associated with NSSI and suicide attempts.²³ However, further comprehensive studies are needed in this regard.

Cigarette, alcohol, and substance use rates were higher in the NSSI group. Substance use and NSSI rates showed similarities including individual (namely, decreasing negative feelings) and social (namely, avoiding exclusion) aspects in theoretical models involving substance use in adolescence.²⁴ Hence, these 2 behaviors (NSSI and substance use) may have been used for coping with problems. In studies using samples based on society, it is demonstrated that NSSI and several other hazardous behaviors, including substance use, frequently are monitored together in adolescents.^{25,26}

Our study agrees with the literature in regard to history of sexual abuse among those with NSSI. An association between NSSI and suicide attempts during childhood, adolescence, and adulthood, and neglect, and abuse in childhood has been demonstrated in studies of the psychopathological effects of childhood abuse.^{12,27}

Table 5 - Comparisons of rates of incidents between NSSI and non-NSSI groups among Turkish children and adolescents undergoing judicial examination (N=295).

Variable	NSSI (n=67)		Non-NSSI (n=228)		X ²	P
	n	(%)	n	(%)		
Multiple crimes	19	(28.4)	18	(7.9)	19.768	<0.001
Cigarette/alcohol/ substance abuse	39	(58.2)	57	(25.0)	26.015	<0.001
Sexual abuse	6	(9.0)	5	(2.2)	6.596	0.01
Suicide attempts	8	(11.9)	0	(0.0)	27.983	<0.001
BDI >17	28	(41.8)	43	(18.9)	14.900	<0.001

NSSI - Non-suicidal self-injury, BDI - Beck Depression Inventory

Our results show that suicide history was more frequent among children and adolescents with NSSI, which has adverse emotional, physical, and social outcomes. Brunner et al¹³ demonstrated that suicide attempts are more frequent in adolescents with NSSI. In another study, NSSI was reportedly the strongest predictor of suicide attempts in depressed adolescents.²⁸ A history of NSSI has been shown to be predictive for further NSSI and suicide attempts in depressed adolescents,^{28,29} and society in general.²⁶ Many forensic children and adolescents who demonstrated NSSI behaviors did not declare suicide attempts, indicating heterogeneity among this segment of the population. Moreover, these findings highlighted the importance of investigating NSSI risk factors and taking all NSSI behaviors seriously, emphasizing the need to investigate factors that may increase risk for NSSI.

We found higher BDI scores among those with NSSI. Similarly, NSSI was more frequent among those with higher BDI scores. Depression is a mood characterized by sorrow, fatigue, despair, and unwillingness. It is well known that changes in sleep and appetite, and loss of interest in hedonic activities are frequently seen in depression. Because a depressive mood contains anger, wrath, and even thoughts of suicide, it may precipitate NSSI. In a study by Haw et al,³⁰ it was shown that 37 of 40 (92.5%) patients with NSSI were also in depression. In another study, Grøholt and colleagues³¹ considered depression a risk factor for adolescents with NSSI.

Several limitations of this research should be noted. First, our sample consisted of child and adolescent forensic outpatients. Thus, findings may not generalize to other populations, including community-based samples of children and adolescents. In addition, NSSI participants were not evaluated for other psychiatric diagnoses. Therefore, comorbid disorders may confound our findings.

In conclusion, we aimed to determine risk factors for NSSI. There are few studies examining NSSI in children and adolescents referred for forensic examination. Our findings show that children and adolescents with NSSI who were referred for forensic examination had important problems in their lives, and they represented a high-risk group with regard to signs of depression. Psychiatric assessment was essential in this group. These findings also suggest that symptoms of major depressive disorder may increase the risk of NSSI in children and adolescents. Future studies should examine the risk factors of this behavior during childhood and adolescence.

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