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Non-Suicidal Self-Injuries in Adolescent Girls: Clinical, Social, and Behavioral Characteristics

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ABSTRACT

BACKGROUND: Despite the increasing prevalence of non-suicidal self-injury among adolescents—particularly girls—its clinical, social, and predictive factors, as well as psychological features, remain insufficiently studied.

AIM: The work aimed to analyze clinical, social, behavioral, and psychological factors associated with non-suicidal self-injury.

METHODS: A total of 186 adolescent girls hospitalized in a specialized psychiatric facility with confirmed episodes of non-suicidal self-injury were assessed as part of a two-year observational study (September 1, 2022–September 1, 2024). Sociodemographic characteristics (age, place of residence, parenting style), clinical variables (diagnoses according to the 10th revision of the International Classification of Diseases, psychiatric history), and behavioral indicators (location and frequency of episodes) were evaluated. Psychological parameters were assessed using the Maria Kovacs Depression Inventory, Raven Progressive Matrices, the Suicide Risk Assessment Scale, and the Individual Typological Questionnaire.

RESULTS: The first episode of non-suicidal self-injury most frequently occurred at ages 13–14 (38.2%). A high level of depression (median score: 64) was associated with interpersonal difficulties and low self-esteem. Behavioral aspects included predominant localization of injuries on the forearms (81.18%) and a tendency to commit episodes at home (83.9%). Suicide risk was identified in 25.8% of participants, and a significant proportion of adolescents demonstrated emotional dysregulation.

CONCLUSION: Non-suicidal self-injury in adolescent girls is associated with a wide range of social, behavioral, and psychological factors. A differentiated approach to assessment and prevention that considers family and emotional aspects is essential for improving treatment and prevention outcomes.

Keywords: non-suicidal self-injury; adolescents; girls; emotional regulation; depression; social factors; behavioral characteristics; family relationships; psychometric scales; clinical features.

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Несуицидальное самоповреждающее поведение у девушек-подростков: клинико-социальные и поведенческие характеристики

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АННОТАЦИЯ

Обоснование. Несмотря на растущую распространённость несуицидального самоповреждающего поведения (NSSI) среди подростков, особенно девушек, клинико-социальные особенности, предикторы и психологические характеристики остаются недостаточно изученными.

Цель. Анализ клинико-социальных, поведенческих и психологических факторов, связанных с NSSI.

Материалы и методы. В рамках двухлетнего наблюдательного исследования (01.09.2022–01.09.2024) обследовано 186 девушек-подростков, госпитализированных в специализированное психиатрическое учреждение с подтверждёнными эпизодами NSSI. Оценивали социально-демографические (возраст, место жительства, стиль воспитания), клинические (нозологическая структура по МКБ-10, психиатрический анамнез) и поведенческие (локализация и частота эпизодов) характеристики. Психологические параметры оценивали по шкале депрессии М. Ковач, матрицам Равена, шкале оценки суицидального риска и индивидуально-типологическому опроснику.

Результаты. Первый эпизод NSSI чаще всего происходил в возрасте 13–14 лет (38,2%). Высокий уровень депрессии (медиана — 64 балла) ассоциировался с межличностными проблемами и низкой самооценкой. Поведенческие аспекты включали доминирующую локализацию повреждений на предплечьях (81,18%) и склонность к совершению эпизодов дома (83,9%). Суицидальный риск выявлен у 25,8% участниц, значительное число подростков демонстрировало эмоциональную дисрегуляцию.

Заключение. NSSI у девушек-подростков связано с широким спектром социальных, поведенческих и психологических факторов. Дифференцированный подход к оценке и профилактике, учитывающий семейные и эмоциональные аспекты, является ключевым для улучшения лечения и профилактики.

Ключевые слова: несуицидальное самоповреждающее поведение; подростки; девушки; эмоциональная регуляция; депрессия; социальные факторы; поведенческие характеристики; семейные отношения; психометрические шкалы; клинические особенности.

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Яшүсмер кызларда тәннәрәнә зыян китергеч суицидаль булмаган тәртип: клиник-социаль һәм үз-үзеңне тотыш характеристикалары

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АННОТАЦИЯ

Нигезләмә. Яшүсмерләр, бигрәк тә кызлар арасында, суицидаль булмаган үз-үзен зарарлаучы тәртипнең (NSSI) үсә баруына карамастан, бу күренешнең клиник-социаль үзенчәлекләре, предикторлары һәм психологик характеристикалары житәрлек дәрәжәдә өйрәнелмәгән килеш кала бирә.

Максат. NSSI белән бәйлә клиник-социаль, үз-үзен тотыш һәм психологик факторларны анализлау.

Материаллар һәм алымнар. Ике еллык күзәтү тикшеренүе кысаларында (01.09.2022–01.09.2024) махсуслаштырылган психиатрия учреждениесендә дәваланучы NSSI эпизодлары расланган 186 яшүсмер кыз тикшерелгән. Аларның социаль-демографик (яшьләре, яшәү урыннары, тәрбия стиле), клиник (МКБ-10 буенча нозологик структура, психиатрия анамнезы) һәм үз-үзләрен тотыш (эпизодларның локализациясе һәм ешлыгы) характеристикаларына бәя бирелә. Психологик параметрларны М.Ковач төзегән депрессия шкаласы, Равен матрицалары, суицид куркынычын бәяләү шкаласы һәм индивидуаль-типологик сораулык буенча билгелиләр.

Нәтижәләр. NSSI ның беренче эпизоды ешрак 13–14 яшьтә була (38,2%). Депрессиянең югары дәрәжәсе (медиа-на — 64 балл) шәхесара проблемалар һәм үзбәянең түбән булуы белән ассоциацияләнә. Үз-үзеңне тоту аспектына зарарлануның күбесенчә беләкләрдә күзәтелүе (81,18%) һәм эпизодларның өйдә башкарылуы (83,9%) керә. Суицид куркынычы яшүсмер кызларның 25,8% да ачыклана, күбесендә эмоциональ дисрегуляция күзәтелә.

Йомгак. Яшүсмер кызлардагы NSSI социаль, үз-үзеңне тотыш һәм психологик факторларның киң спектрына бәйлә. Әлеге халәтне бәяләү һәм булдырмый калуга гаилә һәм эмоциональ аспектыны исәпкә алып дифференциациялә якын килү дәвалау һәм профилактика эшен яхшыртуда төп роль уйный.

Төп төшенчәләр: суицидаль булмаган үз-үзен зарарлаучы тәртип; яшүсмерләр; кызлар; эмоциональ регуляция; депрессия; социаль факторлар; үз-үзеңне тотыш характеристикалары; гаилә мөнәсәбәтләре; психометрик шкалалар; клиник үзенчәлекләр.

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BACKGROUND

Non-suicidal self-injuries (NSSI) is defined as the deliberate, self-inflicted destruction of body tissue without suicidal intent and with the assumption that it will not result in serious physical harm [1–3]. The inclusion of NSSI in the 5th edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a “condition for further study” highlights growing scientific and clinical interest [1, 4]. The prevalence of NSSI among the youth is approximately 15%, reaching 50% in inpatient samples [5–9]. The most common age for NSSI onset is between 11 and 15 years, reaching its peak at 15–17 years, and subsequently declining in early adulthood [10, 11]. The most common methods of self-injury include cutting, hitting, scratching, and burning [12].

The primary NSSI function is the relief of negative affect associated with deficits in emotional regulation [5, 13–16]. Adolescence, characterized by intense emotional and cognitive changes, represents a vulnerable period for NSSI. This behavior is frequently associated with stress from interpersonal conflicts, academic pressure, and family issues, which may lead to long-term consequences, including increased risk of mental disorders and suicidal attempts [17, 18].

This study focused on the analysis of clinical-social, behavioral, and psychological characteristics of adolescent girls (aged 12–17 years) with NSSI episodes hospitalized in a specialized mental health center. The study’s uniqueness lies in examining an adolescent cohort within the Russian context, enabling identification of NSSI-specific factors and development of prevention and intervention strategies.

The study aimed to identify and study socio-demographic, clinical, and psychopathological characteristics of adolescent girls with non-suicidal self-injuries in order to describe key factors associated with this behavior.

METHODS

Study Design

The data on clinical, epidemiological, and social characteristics of adolescent girls with NSSI were collected and analyzed as part of an observational study.

Eligibility Criteria

The target group consisted of girls aged 12–17 years with confirmed NSSI episodes meeting DSM-5 criteria B–F [19–21]. Primary motives included emotional regulation and interpersonal conflicts. Criterion A (≥ 5 episodes per year) was not applied to include patients with rare episodes and study early NSSI stages. The history of suicide attempts was not an exclusion criterion, but absence of suicidal intent during the act was confirmed through clinical interviews. In Russia, NSSI is classified as a symptom in the 10th revision of the International Classification of Diseases (ICD-10) because there is no distinct diagnostic category for it [3, 22].

Participation in the study required a voluntary informed consent from patients or their legal representatives.

Exclusion criteria: psychosis, autism spectrum disorders, trichotillomania, and other conditions with stereotypic self-injury patterns, as well as severe intellectual disabilities precluding testing. Patients diagnosed with F70 were included if the testing capacity was preserved, with responses verified by a clinical psychologist. Patients who refused to participate and adolescents aged under 15 years without legal representative consent were also excluded.

Study Setting

The study was conducted at the Specialized Psychoneurological Hospital of the Ministry of Health of the Krasnodar Region, located at 1 Sadovaya Street, Zarechny Settlement, Vyselkovsky District, Krasnodar Region. The hospital includes 11 inpatient departments with 602 round-the-clock beds. Currently, two general psychiatric departments with 80 and 50 beds respectively provide care for pediatric populations.

Study Duration

The study covered the period from September 1, 2022 to September 1, 2024.

Intervention

The following psychometric tools were used in the study:

- Raven IQ Test [23];
- Maria Kovacs Children Depression Inventory [24];
- Shmelev Suicide Risk Questionnaire (modified by Razuvaeva) [25];
- Multidimensional Anxiety Scale for Children (MASC) [26];
- Socio-Psychological Adaptation Questionnaire (SPAQ) [27];
- Individual Typological Questionnaire [28];
- Scale of Reasons for Self-Injurious Behavior by Polskaya [29];
- Children and Adolescents Social Support Scale (CASSS, by Malecki, adapted by Lifintsev and Ryaguzova) [30].

Main Study Outcome

The main study outcome is to analyze clinical-social and epidemiological characteristics of adolescent girls with NSSI, including quantitative and qualitative assessments of frequency patterns, specific features, and associated factors.

Additional Study Outcomes

Additional outcomes will be presented in further publications.

Subgroup Analysis

All patients meeting the inclusion criteria were invited to participate in the study.

The article does not present the subgroup structure. Comparison results will be published later. This work describes general clinical-social characteristics of the sample.

Outcomes Registration

Main and additional study outcomes were registered using the following tools: medical records (case histories, hospitalization logbooks, medical information system), psychometric tests, specially developed statistical charts, and researcher observations.

Ethics Approval

The study was conducted in accordance with the World Medical Association Declaration of Helsinki (1975, as amended in 2013) and ICH GCP principles. The approval was granted by the Local Ethics Committee of Specialized Psychoneurological Hospital on June 14, 2022 (Protocol No. 204). All participants or their legal representatives provided informed consent for participation, treatment, and publication of anonymized data. The author holds ICH GCP Certificate No. 1063 dated April 11, 2016.

Statistical Analysis

Sample size calculation principles. No preliminary sample size calculation was performed; the cohort size was determined by the hospital bed capacity and patient referral pathways in the Krasnodar Region. The article presents the study design details and first-year data [31]. The second-year results are under peer review.

The statistical analysis methods included descriptive and inferential statistics: calculation of median (Me), quartiles (Q1; Q3), mean, standard deviation, minimum and maximum values (min and max), Mann–Whitney U test for continuous data, and Fisher exact test for categorical data. Differences were considered statistically significant at $p < 0.05$. Additional analysis methods will be described in future publications.

The data were processed using Microsoft Excel 2019 (Microsoft, USA), Statistica 13.5.0.17 (TIBCO Software Inc., USA), and GraphPad Prism 10.4.0.621 (GraphPad Software, USA).

Data availability. The research materials presented in this publication are available in dataset [32].

RESULTS

Participants

Sample

The study included 186 girls aged 12–17 years: 99 participants in the first year and 87 in the second year. Of 693 patients in this age category (345 in the first year, 348 in the second year), 194 female patients meeting the inclusion criteria were invited to participate. Eight of them declined to participate.

Characteristics of the Study Sample (Groups)

The patients' age ranged from 12 to 17 years, with a median of 15 years [Q1: 14; Q3: 16] and a mean of 14.9 ± 1.5 years.

All study participants were Russian citizens. Most patients (72.0%) were natives of the Krasnodar Region, 26.9% came from other regions of the Russian Federation, and 1.1% were from another country. The majority resided in rural areas (56.5%, $p = 0.04$).

The most frequent diagnoses were emotional and behavioral disorders (F90–F98), identified in 67.2% of patients ($p = 0.001$). Mental retardation (F70–F79) was diagnosed in 10.2%, neurotic disorders (F40–F48) in 7.5%, and affective disorders (F30–F39) in 5.9%. Other diagnoses, including schizophrenia (F20–F29) and behavioral syndromes (F50–F55), accounted for less than 2.2%.

Primary Results

Presence and Frequency of Self-Injuries (Polskaya Scale)

The largest proportion of girls (40.86%) most frequently engaged in self-injuries through cutting with sharp objects (Table 1).

The predominant reasons for self-injuries were emotional pain, the need to feel relief, the need to cope with emotions, and the need to calm down (all ≈ 3.5 points; Fig. 1). The most common strategy for self-injuries was tension relief (Me 3.28 [1–5]; Q1: 2.86; Q3: 3.8 points; Fig. 2). The “self-control” strategy (6.07 points) prevailed over the “interpersonal control” strategy (3.74 points). The “somatic self-injury” strategy (2.01 points) prevailed over the “instrumental self-injury” strategy (1.97 points).

Characteristics of Self-Injuries

The most frequent NSSI episodes occurred at an age of 13–14 years: 38.2% for the first episode, 37.6% for the second, and 33.3% for subsequent episodes. Ages 11–12 years ranked second, while early manifestation before the age of 10 years was rare (less than 2%). The complete age distribution of girls is shown in Fig. 3.

Most girls (81.18%) inflicted self-injuries on the skin of their left forearm.

Old scars from previous self-injuries were identified in 77.96% of cases.

The overwhelming majority of adolescents (97.3%) did not use any psychoactive substances prior to self-injury episodes, with only 2.7% reporting substance use ($p = 0.001$). In 90.3% of cases, adolescents were alone during the episodes, while only 9.7% occurred in the presence of witnesses ($p = 0.001$).

Most episodes (83.9%) occurred at home, less frequently in public areas (3.8%), dormitories (5.9%), schools (3.2%), or hospitals (0.5%). The highest number of episodes was recorded on Fridays (19.9%), whereas the lowest occurred on Sundays (5.9%, $p = 0.03$).

The peak time for episodes was in the evening hours: 04:00–08:00 p.m. (38.7%) and 08:00–00:00 a.m. (28.5%). The early morning period (04:00–08:00 a.m.) was the least common, with only 1.6% of cases recorded ($p = 0.001$).

Table 1. Presence and frequency of self-injurious behaviors according to the Polskaya Scale

Parameters	Self-injurious behaviors							
	Never		Once		Occasionally		Frequently	
	abs.	%	abs.	%	abs.	%	abs.	%
Cutting with sharp objects	3	1.61	28	15.05	79	42.47	76	40.86
Piercing or pricking the skin with sharp objects	133	71.51	25	13.44	20	10.75	8	4.30
Self-burning	144	77.42	30	16.13	8	4.30	4	2.15
Punching oneself	118	63.44	24	12.90	30	16.13	14	7.53
Hitting solid surfaces with fist, foot, head, or body	89	47.85	45	24.19	39	20.97	13	6.99
Hair pulling	139	74.73	24	12.90	15	8.06	9	4.84
Skin scratching	110	59.14	23	12.37	32	17.20	21	11.29
Nail biting	75	40.32	14	7.53	49	26.34	46	24.73
Picking scabs	93	50.00	19	10.22	44	23.66	30	16.13
Lip biting	51	27.42	22	11.83	50	26.88	57	30.65
Biting cheeks or tongue	89	47.85	18	9.68	42	22.58	42	22.58
Other	0	0.00	1	0.54	13	6.99	3	1.61

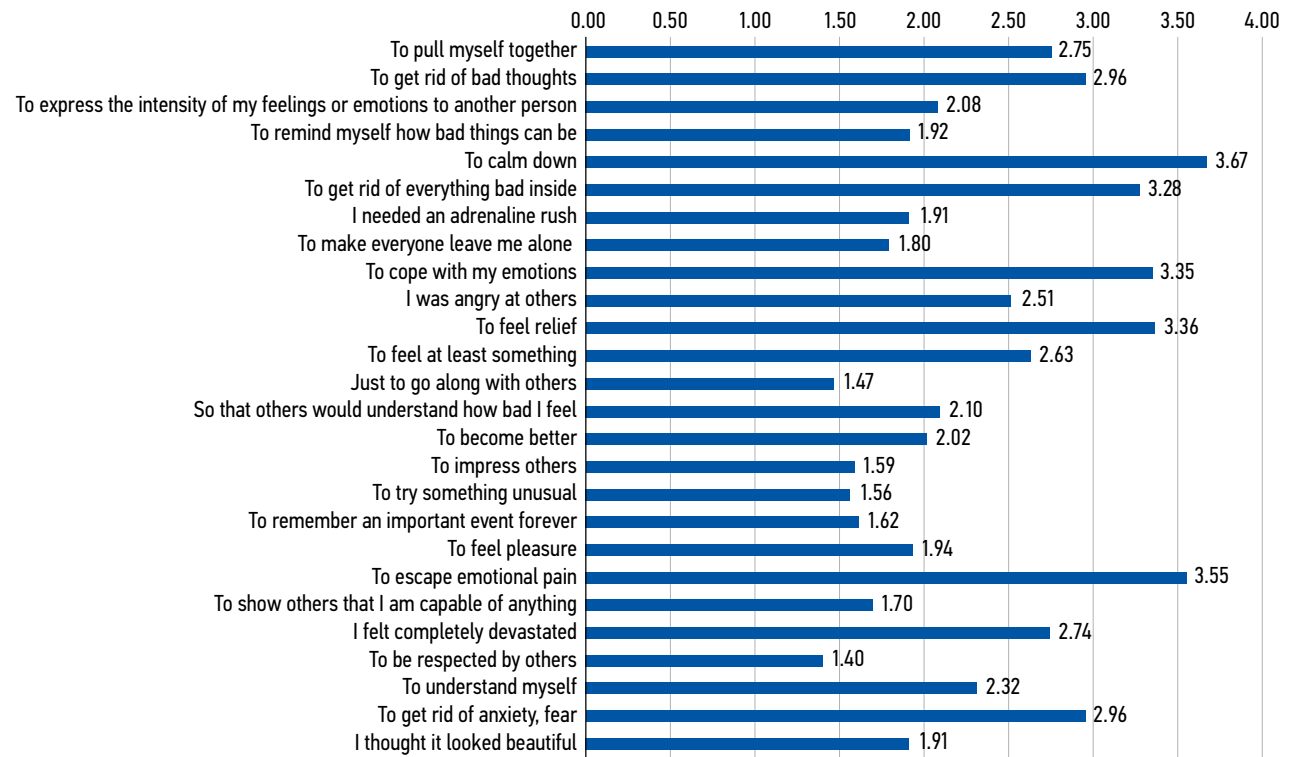


Fig. 1. Reasons for self-injurious behavior: mean scores according to Part 2 of the Polskaya Scale.

For 28.0% of participants, more than 29 days had passed since their last episode; 24.7% reported this period to be 8–14 days, and 18.8% reported 3–7 days ($p = 0.008$).

Most adolescents (70.4%) reported no suicidal thoughts during self-injury episodes; however, 15.6% expressed unwillingness to live, and 4.8% expressed the wish to die ($p = 0.001$).

Self-injury episodes were frequently accompanied by depression (21.0%), anxiety (18.3%), anger (29.0%), tension (18.8%), and self-criticism (31.7%). General distress

was observed in 31.7% of adolescents, while 18.8% exhibited impaired self-control.

62.9% of participants reported no thoughts of self-injury outside episodes. Single episodes of contemplation occurred in 12.9%, recurrent thoughts in 18.8%, and persistent thoughts in 4.8% ($p = 0.001$).

Suicide Attempts in the Past 24 Months

Suicide attempts in the medical history, including both genuine and demonstrative-blackmail attempts not associated

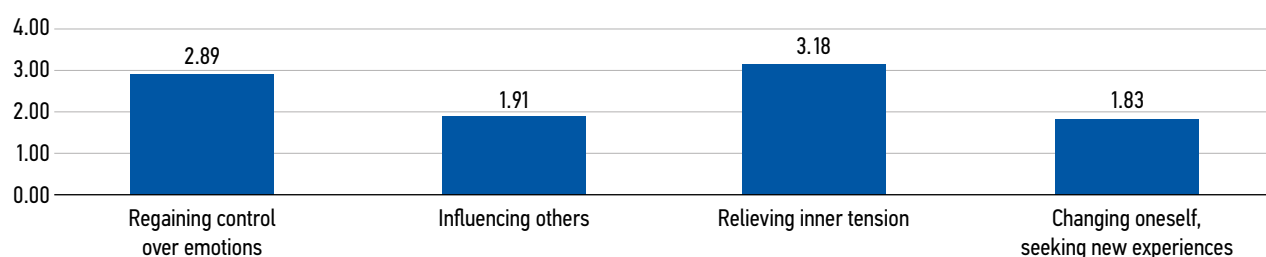


Fig. 2. Mean scores on Part 2 of the Polska Scale for the causes of self-injuries (scores).

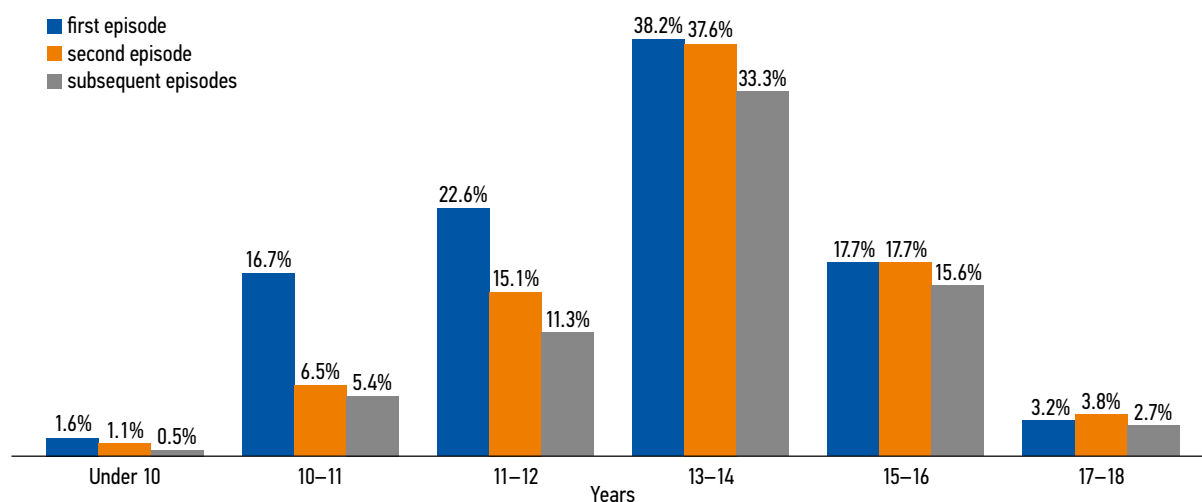


Fig. 3. Age distribution of adolescent girls at the time of self-injury episodes.

with NSSI episodes, were recorded in 25.8% of adolescents, with 18.8% having made single attempts and 7.0% multiple attempts. The majority (73.7%) had no history of attempts. The most common method was drug intoxication (19.4%), followed by forearm lacerations (4.3%), and hanging (3.8%). No cases involving sharp objects or firearms were reported.

Results of Psychological Scales and Tests

This article presents the results of analysis using the following psychodiagnostic scales: Maria Kovacs Depression Scale, Raven Progressive Matrices, Suicide Risk Assessment Scale, and Individual Typological Questionnaire. The results of other tests used in the study (MASC, SPAQ, CASSS, etc.) will be covered in further publications.

Maria Kovacs Depression Scale. Psychodiagnostics revealed a mean depression score of 61.5 ± 17.6 (min, 34; max, 100; 95% CI: 59.0–64.1; Q1–Q3: 49.0–70.8). Interpersonal issues predominated (Me, 64; min, 39; max, 95; Q1–Q3: 40–64), characterizing adolescents as prone to negativism and aggressive behavior.

Scale A (Negative Mood) showed Me, 59.6 (min, 37; max, 92; Q1–Q3: 48–70), reflecting reduced mood, anxiety, and anticipation of troubles.

Scale C (Inefficacy): Me, 57.2 (min, 38; max, 95; Q1–Q3: 45–66), indicating high uncertainty in academic performance.

Scale E (Negative Self-Esteem): Me, 57.1 (min, 39; max, 95; Q1–Q3: 40–64), demonstrating negative perceptions of self-efficacy.

Raven Progressive Matrices. Cognitive abilities assessed by Raven Progressive Matrices averaged 79.4 ± 7.2 (min, 63; max, 99; 95% CI: 78.4–80.4; Q1–Q3: 75.0–85.0).

Suicide Risk Assessment Scale. Girls exhibited high levels of social pessimism (4.0 points; Q1–Q3: 3–5) and affectivity (3.3 points; Q1–Q3: 2–5), with low scores in maximalism, cultural barrier breakdown, uniqueness, and anti-suicidal factors.

Individual Typological Questionnaire. The questionnaire revealed maladaptive traits including extraversion (1.08%), introversion (9.14%), anxiety (5.38%), and others. The group's mean profile showed accentuated extraversion (5.04 points), indicating emotional tension and internal conflict.

Secondary Results

Behavior and Social Aspects

Body modifications. Most girls (66.7%) had no body modifications. Among the participants with modifications, visible area piercings were reported in 11.3%, intimate area piercings in 1.1%, visible body tattoos in 25.3%, and intimate area tattoos in 2.7%. Cases included decorative scars (0.5%), unconventional hairstyles/hair coloring (1.6%), and other modifications (0.5%).

Smoking and extreme hobbies. Smoking was reported by 40.9% of participants, whereas 58.6% were non-smokers. Only 1.1% engaged in extreme sports, compared with 98.9% showing no interest.

Eating behavior disorders. Disordered eating patterns were identified in 15.1%, of them anorexia nervosa in 10.2%, atypical anorexia in 1.6%, bulimia in 3.2%, psychogenic overeating in 0.5%. No eating disorders were found in 84.9%.

Online communities with self-injury topics. Twenty-two percent reported awareness (via recommendations), 3.2% actively searched for information, 5.4% self-reported membership vs 1.6% per parental reports. Non-membership was claimed by 44.6%, acquaintances in communities were reported by 11.3%, and there were no reliable data in 22.0%.

School bullying episodes. Self-reported bullying was observed in 34.4%; in 1.1%, bullying was reported by parent/guardian reports. No bullying was claimed by 64.0%; the data were missing in 1.6%.

DISCUSSION

The clinical, social, and behavioral characteristics of 186 adolescent girls with NSSI were analyzed. NSSI typically started at the age of 13–14 years, with injuries localized to the forearms; the episodes occurred at home without witnesses or suicidal ideation. Participants exhibited high levels of depression and interpersonal issues, highlighting the role of emotional dysregulation. Social factors, including the family structure and parental antisocial behavior, were found to be significant.

The results confirm key findings from the preliminary analysis [33], including the mean age (14.69 years) and predominance of primary hospitalization (72.73%). In the expanded cohort (186 patients), the median age was 15 years, with primary clinical diagnoses being emotional and behavioral disorders (F90–F98; 67.2%).

The analysis using Polskaya's scale revealed that the primary purpose of NSSI in adolescent girls was emotional regulation, with a predominance of physical methods, particularly cutting (40.86%). Key motives included relief from emotional pain and tension reduction. Self-control scores (6.07 points) exceeded interpersonal strategy scores (3.74 points), confirming the dominance of internal triggers [5]. Less aggressive forms, such as lip biting (30.65%) and nail biting (24.73%), were more frequent than self-burning (2.15%) and hair-pulling (4.84%), potentially due to lower stigma or milder forms of the disorder.

The location of injuries on the left forearm (81.18%) and the use of cutting as the primary NSSI method remained unchanged. Social factors such as distorted family structure and parents' antisocial behavior confirm their significance [3, 22, 34].

Comparison with other studies [12, 35, 36] indicates similarities in bullying frequency (34.4%), the role of distress and depression (Kovacs Scale, 61.5). Key NSSI motives like emotional tension (89%) and pursuit of pleasure (84%) [37] align with current data. The low frequency of psychoactive substance use (2.7%) prior to NSSI episodes distinguishes this study sample [34].

Self-expression elements, including tattoos and piercings, partially overlap with observations by Mendelevich [3]. However, aspects of decision-making and novelty-seeking require further investigation [38, 39]. Thus, the study highlights universal NSSI characteristics (emotional regulation, distress, social factors) and unique features of the sample population.

Study Limitations

The study has several limitations. The sample consisted of female patients from a specialized psychiatric institution, which limits generalization to the general population of adolescents with NSSI. The effects of pharmacological and psychotherapeutic interventions were not analyzed, as data collection occurred within the first three days of hospitalization when treatment impact was minimal, ensuring objectivity of psychometric indicators. Gender: Only female participants were included, precluding analysis of gender differences. Data: Partial information obtained from medical records and surveys may introduce subjectivity. Control group: The lack of comparison with adolescents without NSSI limits risk factor analysis. Cultural context: Conducted in a single Russian region, reducing applicability to other cultural settings.

CONCLUSION

Non-suicidal self-injury in adolescent girls is associated with a wide range of social, behavioral, and psychological factors. A differentiated approach to assessment and prevention that includes family and emotional aspects is essential for improving treatment outcomes.

ADDITIONAL INFORMATION

Authors' contribution: E.V. Darin, E.N. Sokolova — literature review, data collection; E.V. Darin, I.S. Korol — analysis and interpretation of results; E.V. Darin, E.O. Boyko — conducting statistical analysis; E.V. Darin, O.G. Zaitseva — drafting the manuscript and forming its final version; E.V. Darin, I.S. Korol, E.O. Boyko, O.G. Zaitseva — critical revision of the draft manuscript with the introduction of valuable intellectual content. All authors confirm that their authorship meets the international ICMJE criteria (all authors have made a significant contribution to the development of the concept, research and preparation of the article, read and approved the final version before publication).

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