

SELF-HARM BEHAVIOR AND SUICIDALITY AMONG ADOLESCENTS IN SAMARA REGION

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SUMMARY

Introduction: Self-harm behavior is a significant global concern, with Russia among the countries with high prevalence rates. Adolescents and young adults (15-29 years old) are particularly vulnerable, with suicide being the fourth leading cause of death in this age group. Our objective was to present statistics on suicidality and non-suicidal self-harm behavior (NSSH) among adolescents in the Samara region and to identify psychosocial differences between patients hospitalized for the first time and those hospitalized repeatedly.

Subjects and methods: This study is a retrospective chart analysis of adolescents hospitalized due to suicidal ideation or attempts in 2023. Data were collected from hospital records, comprising a diverse sample of adolescents.

Results: The sample included 76 adolescents, with a significant gender imbalance, as 84.2% were female. Chronic family conflicts presumably were the most influential factor, rather than family composition. Data on hereditary predisposition were subjective and presumably did not correlate with the number of hospitalizations. Fetal hypoxia was the only notable perinatal pathology. Self-harm behavior was more common in readmissions, while suicidal thoughts were present in similar proportions in both initial and repeat hospitalizations. The main reasons for self-harm behavior were the desire to gain control over life or to relieve emotional pain. Only 2.6% of cases were directly aimed at suicide.

Conclusions: Identified risk factors for suicidal behavior among adolescents included female gender, an unfavorable family environment, and NSSH, which, although not directly suicidal, increased the risk of future suicidal behavior. These factors should be considered in the diagnosis and prevention of suicidal behavior.

Key words: adolescents - learned suicidality - self-harm behaviour - suicidality - reasons for self-harm behaviour

Abbreviations: HIV – human immunodeficiency virus; NSSH – non-suicidal self-harm; OCD – obsessive-compulsive disorder; WHO – World Health Organization

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INTRODUCTION

Self-harm behavior is a serious problem worldwide, especially so in the Russian Federation, where the crude suicide rate was 10.7 per 100,000 population in 2021, according to the WHO. The situation has been deteriorating every year, and the conditions of forced isolation contributed to a significant increase in the risk of suicidality during the COVID-19 pandemic. The most vulnerable group among those at risk for suicide are adolescents and young people (15-29 years old); suicides were the fourth leading cause of death in this age range (Kipoulas et al. 2020, Spirito & Esposito-Smythers 2006).

Since the beginning of the 21st century, suicidality has significantly increased (by 200%) in the USA, especially among children and adolescents aged 10-19 years, thus becoming the second leading cause of death in this age group (Clarke et al. 2019). In European countries, the epidemiological situation regarding suicidality is little better; according to WHO statistics, suicidality has significantly increased over the past decade. In

Germany, despite the significant prevalence of suicidal behavior among elderly men and the relatively low absolute numbers of suicides among children and adolescents (in 2017, only 212 suicides were registered among individuals aged 10 to 20 years), according to school surveys, 36.4-39.4% of respondents reported having suicidal thoughts, and 6.5-9% reported suicide attempts (Becker & Correll 2020). While elderly men are more prone to suicides, girls are the most vulnerable group among adolescents (Nosova et al. 2022).

Furthermore, the reason for self-harm in adolescents is usually not a serious suicide attempt. The more frequently cited behind self-harm include pleasure seeking, relieving emotional pain, or seeking control over oneself and one's situation. In such cases, we define these behavior patterns as non-suicidal self-harm (NSSH). The phenomenon of suicidality involves suicidal thoughts and actions aimed at a radical cessation of suffering due to complaints such as unbearable emotional pain, or episodes of life-crises that seem hopeless. Although NSSH and suicidal behavior are phenomenologically

different, their interrelation is undeniable, and a history of NSSH remains one of the most important predictors of subsequent suicidal behavior (Boxer 2010). According to the phenomena of “learned suicidality”, the strongest predictor of suicidal risk is previous self-harm behavior. Young people learn to react with stereotypical patterns of behavior to stressful situations, thereby learning to endure pain and get used to aversive events such as the sight of blood (Syunyakov et al. 2022). Presently, suicidality in children and adolescents is quite a sensitive topic in the Russian Federation, leading to a paucity of public health information and publication of relevant statistics.

Given the importance of the problem, we aimed to describe the family, sociodemographic and psychological characteristics of adolescents from the Samara region who had been admitted to hospital after a suicide attempt, non-suicidal self-harm behavior, or due to suicidal thoughts. We also aimed to identify psychosocial differences between patients hospitalized for the first time with suicidal thoughts and intentions and those with repeated hospitalization.

METHODS

This study is a retrospective chart analysis of adolescents hospitalized due to suicidal ideation or attempts in 2023 in the region of Samara. The study population included individuals admitted to a specialized psychiatric hospital, focusing on those with primary (first-time) and repeated (subsequent) hospitalizations. Data were collected from the source of hospital documentation, comprising a diverse sample of adolescents.

Data were extracted from the hospital's health records. Variables of interest included demographic information, family background, hereditary predispositions, perinatal pathologies, psychological symptoms, and reasons for self-harm. Specifically, the study examined the following variables: gender, age, type of family, self-reported family relations, hereditary predisposition (group), hereditary predisposition (degree), perinatal pathology, self-harm and self-violence, suicidal thoughts, emotional instability, impulsive phenomena, obsessive-compulsive disorder, anxiety and irritability, reasons for self-harm.

Descriptive statistics were utilized to summarize the characteristics of the study population. The primary focus was on comparing the groups with primary and repeated hospitalizations to understand better their differences and similarities across various variables:

- **Categorical Variables:** These were summarized using counts (n) and percentages (%). The specific categorical variables included gender, type of family, self-reported family relations, hereditary predispositions (both group and degree), perinatal pathologies, self-harm and self-violence, suicidal thoughts, emotional

instability, impulsive phenomena, obsessive-compulsive disorder, anxiety and irritability, and reasons for self-harm. For each variable, frequencies and percentages were calculated separately for primary, repeated, and combined groups.

- **Continuous Variables:** Age was the only continuous variable, summarized using mean and standard deviation (SD). Descriptive statistics for age were calculated separately for primary, repeated, and combined groups.

The study was conducted in accordance with ethical standards and institutional guidelines. Given the retrospective nature of the study, informed consent was waived. Data were anonymized to ensure patient confidentiality and privacy.

RESULTS

Our study encompassed 76 adolescent participants, with 42 primary cases (first-time hospitalizations) and 34 cases hospitalized two or more times (Table 1). Their aged ranged from 13 to 17 years (mean = 15.6, SD=0.84, Median = 16, Q1 = 15, Q3 = 16). The sample was predominantly female (84.2%, n=64), with only 15.8% (n=12) male participants.

In general, our analysis of family structure revealed that 34.2% (n=26) came from complete families, while 65.8% (n=50) came from various types of incomplete families: 32.9% (n=25) from single-parent families, 14.5% (n=11) from blended families, 10.5% (n=8) from extended families, 3.9% (n=3) from families with absent parents, and 2.6% (n=2) from guardian families.

Regarding family relationships, 30.3% (n=23) reported a non-pathological family environment, while 69.7% (n=53) reported some form of family problems. Specifically, 46.1% (n=35) reported frequent or chronic conflict situations at home, 21.1% (n=16) had multiple types of family problems, and 1.3% (n=1) reported parental indifference.

Family history of mental health issues was reported in 55.3% (n=42) of participants. Specifically, 46.1% (n=35) reported a family history of impulsive disorders or addictions, 3.9% (n=3) reported schizophrenia, 2.6% (n=2) dementia, and 2.6% (n=2) Down's syndrome.

Perinatal pathology was absent in 65.8% (n=50) of cases, while 34.2% (n=26) reported some form of birth complications. The most common was fetal hypoxia, reported in 10.5% (n=8) of cases, followed by umbilical cord entanglement (9.2%, n=7), hydrocephalic syndrome (2.6%, n=2), and various individual cases such as HIV infection, hemolytic disease of the newborn, and neonatal jaundice (1.3% each, n=1).

Self-harm behavior was reported by 48.7% (n=37) of participants, followed by anxiety and irritability in 23.7% (n=18) of the sample. Poor impulse control or addictions were observed in 26.3% (n=20) of participants,

Table 1. Demographic, family, clinical, and behavioral characteristics of patients with single and repeated hospitalizations for suicidal behavior

Variable/Statistic		Categories		Hospitalizations			
				Single (n=42)		Repeated (n=34)	
				n	%	n	%
Sex	Female			34	81.0	30	88.2
	Male			8	19.0	4	11.8
Family type	Complete family			13	31.0	13	39.4
	Mixed family			6	14.3	5	15.2
	Single-parent family			12	28.6	13	39.4
	Extended family			8	19.0	0	0.0
	Family with absent parents			1	2.4	2	6.1
	Foster family			2	4.8	0	0.0
				2		0	
Self-assessment of family relationship	Non-pathological family environment			9	21.4	14	42.4
	Multiple types of problems in the family			16	38.1	0	0.0
	Frequent/chronic conflict situations in the family			17	40.5	18	54.5
Subjective report of hereditary predisposition	Parental indifference			0	0.0	1	3.0
	No family history			19	45.2	15	44.1
	No information on diagnosis			1	2.4	0	0
	Impulsive traits (including addiction)			18	45.2	16	47.1
	Down syndrome			1	2.4	1	2.9
	Dementia			1	2.4	1	2.9
	Schizophrenia			2	4.8	1	2.9
Subjective report of hereditary predisposition (degree of kinship)	No family history			18	42.9	15	44.1
	Family history in second-degree relatives			11	26.2	10	29.4
	Family history in first-degree relatives			13	31.0	9	26.5
Perinatal pathology	Hypoxia			4	20.0	4	12.1
	Coloboma, congenital strabismus			1	5.0	0	0.0
	Umbilical cord entanglement, cephalohaematoma, hydrocephalus syndrome			1	5.0	0	0.0
	HIV infection			1	5.0	0	0.0
	Prematurity, foetal haemolytic disease			1	5.0	0	0.0
	Newborn jaundice			1	5.0	0	0.0
	Umbilical cord entanglement, hypoxia			1	5.0	1	3.0
	Umbilical cord entanglement			3	15.0	4	12.1
	Umbilical cord entanglement, hydrocephalus syndrome, cephalohaematoma, mixed muscular dystonia syndrome			1	5.0	0	0.0
	Asphyxia and newborn jaundice			1	5.0	0	0.0
	Hydrocephalus syndrome			2	10.0	0	0.0
	Premature discharge of amniotic fluid			1	5.0	0	0.0
	Umbilical cord entanglement, hypoxia of foetus			1	5.0	0	0.0
	Hydrocephalus			1	5.0	0	0.0
				1		0	
				1		0	
Self-harm and self-violence	Yes			14	33.3	23	67.6
	No			28	66.7	11	32.4
Suicidal thoughts	No			32	76.2	29	85.3
	Yes			10	23.8	5	14.7
Emotional instability	No			40	95.2	34	100.0
	Yes			2	4.8	0	0.0
Impulsive phenomena	Yes			15	35.7	5	14.7
	No			27	64.3	29	85.3
OCD	No			37	88.1	30	88.2
	Yes			5	11.9	4	11.8
Anxiety. irritability	Yes			17	40.5	1	2.9
	No			25	59.5	33	97.1

Table 1. Continues

Variable/Statistic	Categories	Hospitalizations					
		Single (n=42)		Repeated (n=34)		Total (n=76)	
		n	%	n	%	n	%
Reasons for self-harm	Relieve pain	7	16.7	1	3.0	8	10.5
	Improve control	12	28.6	25	75.8	37	48.7
	Pleasure	2	4.8	0	0.0	2	2.6
	Punish	3	7.1	2	6.1	5	6.6
	Flamboyant	1	2.4	1	3.0	2	2.6
	Not applicable	13	31.0	0	0.0	13	17.1
	Suicide	1	2.4	1	3.0	2	2.6
	Difficult to explain	2	4.8	3	9.1	5	6.6
	For the company	1	2.4	0	0.0	1	1.3

while obsessive-compulsive symptoms were present in 11.8% (n=9) of the sample. However, it is noteworthy that emotional instability was registered in only 2.6% (n=2) of participants, which is a lower proportion than expected, perhaps suggesting that emotional instability is still developing in children of this age group, on a trajectory to become more pronounced later in life.

In the analysis of medical records regarding the explanations for self-harm, 51.3% (n=39) of participants either did not engage in self-harm or found the question inapplicable. For those who provided explanations, the motivations varied: only 2.6% (n=2) had explicitly aimed at suicide, while 48.7% (n=37) indicated that they engaged in self-harm to gain a sense of control over their lives, 10.5% (n=8) reported doing so to relieve emotional pain, and 2.6% (n=2) described deriving pleasure from the behavior. Additionally, 6.6% (n=5) indicated that their self-harm was intended to punish loved ones, and 1.3% (n=1) mentioned participating in suicidality as part of group behavior. Finally, 2.6% (n=2) cited unusual reasons and 6.6% (n=5) were unable to specify a reason.

DISCUSSION

Our study, focusing on hospital admissions due to suicidal behavior or attempts, reveals several notable patterns that warrant further discussion and investigation, in the face of a crisis of suicidality among adolescents in the Samara region. The data comparison between single (primary) and repeated (secondary) admissions provides valuable insights into the characteristics and progression of suicidal behavior (Caro-Canizares et al. 2019, Miranda-Mendizabal et al. 2019, Prinstein et al. 2008, Turecki & Brent 2016).

First and foremost, the striking predominance of females in our sample (84.2%) suggests a significant gender disparity in hospital admissions for suicidal behavior (Nock et al. 2013). This marked overrepresentation of females could indicate gender-specific risk factors, differing expressions of suicidal behavior between sexes, or potential biases in hospital admission processes for suicidal individuals (Turecki & Brent 2016).

Family structure and dynamics appear to be critical factors in our patient population. The high prevalence of non-traditional family structures, with single-parent and blended families accounting for almost half of the sample, indicates the potential role of family instability and associated disorganization of emotional development in the formation of exacerbated suicidal behavior (Brent et al. 2015, DeVille et al. 2020, Turecki & Brent 2016). Moreover, the frequent reporting of chronic conflict situations within families (46.05%) underscores the importance of considering family dynamics both in the etiology and management of suicidal behavior.

The data strongly suggests a hereditary component to suicidal behavior, with over half of the patients reporting some form of familial predisposition (Brent et al. 2015, Turecki & Brent 2016). An abundance in family history of impulsive disorders and addictions may indicate a possible genetic link between impulsivity, addiction, and suicidal behavior, as was proposed in previous research (Lima et al. 2017).

When comparing individuals with single and multiple admissions, the study reveals distinct patterns. In previous research, patients with multiple admissions exhibited a more severe and complex clinical profile, with higher rates of comorbid mental health conditions, substance abuse, and interpersonal difficulties (Adam et al. 1980, Carroll et al. 2014). Importantly, the present study also identifies a concerning trend of increased suicidal intent among individuals with several admissions per year, underscoring the need for enhanced monitoring and tailored interventions for this ultrahigh-risk population.

The marked increase in self-harm behaviors in the repeated admission group (67.7% vs 33.3% in the single admission group) raises important questions about the progression of suicidal behavior over time. This could indicate that self-harm becomes a more entrenched behavior in individuals with repeated suicidal crises, or that patients engaging in self-harm are at higher risk for repeated hospital admissions (Carroll et al. 2014, Prinstein et al. 2008).

Self-harm behavior was more common among those with repeated hospitalizations, possibly reflecting the phenomenon of "learned suicidality" (Syunyakov et al. 2022). In analogy to the phenomenon of learned helplessness, this suggests that adolescents may develop a stereotypical behavioral response (self-harm) to stressful situations, learning to tolerate pain and perhaps becoming accustomed to the sight of blood, i.e., overcoming aversion to self-harm. This concept provides a potential explanation for the increased prevalence of self-harm in patients with multiple admissions and underscores the importance of early intervention to prevent the development of such maladaptive coping mechanisms.

The shift in reasons for self-harm, with "improving control" becoming much more prevalent in the group of patients with several readmissions, suggests that they had undergone an evolution in their reasoning or perception of the 'utility' of self-harm behaviors over time. Patients may initially engage in self-harm as a means of coping with emotional distress, but over repeated iterations, the behavior may become a maladaptive method to manage and regulate their internal states, potentially reinforcing the behavior (Gunnell et al. 2008). This is consistent with the emergence of borderline personality traits during adolescence, which have the same predisposing factors as seen in the present study (Eckerstrom et al. 2020).

On the other hand, the frequency of anxiety and irritability is also notably reduced in individuals with two or more hospitalizations compared to a single hospitalization (2.9% vs 40.5%) as is the frequency of behavioral phenomena associated with impulsivity (14.7% vs 35.7%). These unexpected results may also signal an emerging stereotypical behavioral pattern in individuals with recurrent suicidal behavior and a concomitant decrease in the severity of their emotional distress and fear of self-harm.

Taken together, these data paint a picture of suicidal behavior among adolescents as a complex, multifaceted phenomenon with strong links to family dynamics, hereditary factors, and self-harming behaviors. The observed differences between single and multiple admissions underscore the ideas about the developing nature of suicidal behavior, which may be characterized by changes over time in symptom severity, switches in coping mechanisms, and the formation of learned suicidality and habituation to fear of self-injury.

Further research is needed to elucidate the mechanisms behind these observed patterns, particularly the pronounced gender disparity, the evolution of self-harm behaviors, and the apparent shifts in anxiety and impulsivity across multiple admissions. Longitudinal studies could provide valuable insights into the trajectory of suicidal behavior and the factors influencing repeated hospitalizations (Prinstein et al. 2008). Additionally,

investigations into the effectiveness of targeted interventions, especially those addressing family dynamics and self-harm behaviors, could significantly enhance our approach to preventing repeated suicidal crises and improving long-term outcomes for these high-risk individuals.

CONCLUSIONS

The results of this retrospective study of medical charts analysis provide a deeper understanding of the complex of factors contributing to adolescent suicidal behavior in Samara Oblast. The permissive role of female gender, unfavorable family environment, and non-suicidal self-harm (NSSH) behaviors as key risk factors for suicidal behavior was confirmed. In addition, these findings suggest the presence of a hereditary risk of suicidal behavior, indicating a potential genetic link between impulsivity, substance abuse, and suicidality.

Analysis of the differences between patients with single and repeated hospitalizations for suicidal behavior reveals an intriguing picture that can be interpreted through the lens of the concept of "learned suicidality". This theory holds that patients learn over time to respond to stressful situations with habitual self-injurious patterns of behavior, while paradoxically reducing the severity of their acute emotional distress.

The observed data demonstrate that patients with repeated hospitalizations are significantly more likely to engage in self-harming behaviors but less likely to report suicidal ideation. This may indicate that self-harming behavior has become for them an automatic or unreflected response to stress, as a kind of learned coping mechanism that is not always accompanied by conscious suicidal intentions.

It is interesting to note that the patients with repeated hospitalizations showed fewer impulsive phenomena and signs of anxiety or irritability. This may be interpreted as a manifestation of their reduction in acute emotional stress, consistent with the model of learned suicidality. As self-harm behavior becomes habitual with practice, it may paradoxically reduce the severity of acute emotional reactions to stress.

Most notably, patients with repeated hospitalizations are more likely to use self-harm to "improve control." This shift in motivation away from severe dysphoria may reflect deeper psychological problems, such as emerging borderline personality traits, and thus emphasizes the need for therapeutic approaches that address these changing motivations. Finally, the unexpected reduction in anxiety and impulsivity in those who repeatedly received treatment suggests that repeated exposure to self-injurious behaviors may lead to emotional desensitization. Consistent with this concept, the patients with repeated hospitalizations were more likely to rate their family environment as non-

pathological. They may perceive their family situation as less problematic because they have learned to “deal” with their psychosocial problems through self-harm, again indicating the learned nature of their behavior. As such, self-harm may have become a tool for them to regulate their emotions, which is entirely consistent with the idea of learned suicidality. Self-harm becomes not just a reaction to stress, but a way of managing one's emotional state. The concept of learned suicidality helps explain why patients with repeated hospitalizations may outwardly appear to be more emotionally stable, but are more likely to resort to self-harm. This perspective highlights the importance of early intervention and the need to develop therapeutic approaches aimed at disrupting these learned patterns of behavior. Overall, analyzing our cross-sectional data through the lens of the concept of learned suicidality reveals a complex dynamic between recurrent suicidal behavior, emotional regulation, and adaptation to stress. This insight may inform the development of more effective prevention and treatment strategies that address the chronic and adaptive nature of suicidal behavior in patients with repeated hospitalizations.

Limitations

Seeing the limitation of this study in its relatively small sample, we believe that it is necessary to develop further the topic of comparing adolescents with primary and repeat hospitalizations for self-harming and suicidal behavior in order to form the most effective methods of preventing NSSH and suicidality.

Acknowledgements:

The authors express gratitude to Prof. Paul Cumming of Bern University Hospital for critical reading of the manuscript.

Conflict of interest: None to declare.

Contribution of individual authors:

Mikhail Sheifer, Marina Pavlova & Timur Syunyakov were responsible for collecting and analyzing statistics.

Tatiana Ashcheulova, Daria Smirnova & Timur Syunyakov have composed the primary idea.

Tatiana Ashcheulova, Oxana Chigareva & Kseniya Bikbaeva have been responsible for the literature data collection, its systematization and analysis.

Tatiana Ashcheulova & Oxana Chigareva wrote the first draft of the manuscript.

Mikhail Sheifer, Marina Pavlova, Daria Smirnova & Timur Syunyakov managed the research documents formalization, detailed manuscript editing and revision.

All authors gave their final approval of the manuscript for submission.

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