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Sociodemographic and clinical risk factors in adolescent non-violent suicide attempts: A prospective study

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ABSTRACT

***Introduction*:** Suicide is a major global public health concern and the fourth leading cause of death among individuals aged 15–29. In Turkey, the crude suicide rate has shown a consistent increase in recent years. This study aimed to evaluate the sociodemographic and clinical characteristics of patients presenting to the pediatric emergency department following non-violent suicide attempts, and to identify associated risk factors.

***Methods*:** In this prospective study, patients under 18 years presenting with nonviolent suicide attempts were included. Data collected comprised demographic and clinical features, psychiatric history of children and families, family dynamics, and substance use. Standardized tools used included the Family Assessment Device–Communication subscale, Adolescent Friendship Attachment Scale, Parenting Style Scale, and Beck Scale for Suicide Ideation.

***Results*:** Of 101 patients (82.2% female; mean age 15.5 ± 1.3 years), 44.6% used their own medications, most frequently nonsteroidal anti-inflammatory drugs (19.6%). Psychiatric diagnoses were identified in 31.6%, prior suicide attempts in 43.6%, and tobacco/alcohol use in 35.5%. Poor family communication was observed in 73.3% of families, and authoritarian parenting in 35.6%. Substance use was found to predict recurrent suicidal ideation, while previous attempts and poor family communication predicted greater severity of suicidal ideation (OR = 3.093; p = 0.025), (OR = 4.267; p = 0.003), (OR = 3.218; p = 0.011).

***Conclusion*:** Adolescents with substance use, prior suicide attempts, and poor family communication are at significantly increased risk for severe or recurrent suicidal ideation.

Keywords: *child; suicide; suicide attempted; risk factors; substance related disorders.*

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INTRODUCTION

Suicide, defined as the intentional act of ending one's own life, is a major global public health issue, causing about 703 000 deaths annually and ranking among the top ten causes of death worldwide.[1] Suicidal behavior is linked to complex factors such as hopelessness, unmet needs, mental and physical health problems, and stressful life events. It is never caused by a single factor, making its explanation and prediction highly challenging.[2,3]

Suicide attempts can generally be categorized as violent (e.g., hanging, use of firearms, jumping from height, or self-immolation) and non-violent (e.g., ingestion of drugs, chemicals, or gas). Non-violent methods are more frequent among adolescents and often reflect impulsive behavior associated with psychosocial and familial factors.[4] Suicide attempts are rare before the age of 15 but become increasingly prevalent during adolescence and adulthood. According to the World Health Organization (WHO), suicide is the fourth leading cause of death among adolescents aged 15-19.[1] Reports from the United States indicate a significant rise in suicide rates among adolescents and young adults.[5] In Turkey, particularly over the past decade, suicide has most frequently affected individuals in the 15-24 age group.[6] The emergence of suicide attempts and clusters among children and adolescents has brought suicide prevention among youth to the forefront of public health strategies, prompting the development of targeted interventions and policy initiatives.

The aim of this study was to evaluate the sociodemographic and clinical characteristics, family dynamics, and associated risk factors of adolescents admitted to the pediatric emergency department following non-violent suicide attempts.

METHODS

This prospective study was conducted between May 2023 and November 2024 at the Pediatric Emergency Department of Kanuni Sultan Suleyman Training and Research Hospital in Istanbul, Turkey. The study protocol was approved by the hospital's ethics committee (KAEK/2023.04.46), and informed consent was obtained from the families of all patients.

In this study, patients who presented due to non-violent suicide attempts were prospectively evaluated. Being under the age of 18, presenting due to a non-violent suicide attempt, having an official forensic report, and possessing complete medical records were considered inclusion criteria.

Data were collected on patients' age, sex, employment and educational status, socio-economic level, number of siblings, parental education levels, marital status, history of previous suicide attempts, psychiatric illness in the family, use of tobacco and alcohol, the names and duration of medications ingested, whether the medications belonged to the patient, time to hospital admission, need for intensive care, and treatment and diagnostic outcomes.

Evaluation of risk factors

Several standardized instruments were used to identify risk factors associated with suicidal behavior. The Family Assessment Device (FAD) was used to evaluate family communication. It is a tool designed to assess how well a family functions across various domains.[7] Nine questions from the communication subscale were completed by parents. Scores ranged from a minimum of 9 to a maximum of 36. Based on total scores, families were categorized as having healthy communication (9–18 points) or unhealthy communication (19-36 points). The Adolescent Friendship Attachment Scale (AFAS) was employed to assess the quality of peer relationships in terms of attachment styles. The scale includes 23 items and consists of three subdimensions: secure attachment, avoidant attachment, and anxious/ambivalent attachment.[8] Parenting styles were assessed using the Parenting Style Scale in four groups: permissive/neglectful, democratic, protective, and authoritarian.[9,10] To assess the severity of suicidal ideation, the Beck Scale for Suicide Ideation (BSS) was used. The scale ranges from 0 to 38, with higher scores indicating more severe suicidal thoughts.[11] Participants were grouped based on their total scores: Group 1 (0–13 points), Group 2 (14–26 points), and Group 3 (27–38 points). All instruments used in our study have Turkish adaptations with acceptable psychometric properties.[12-15]

Statistical analysis

G*Power 3.1 was used to perform the power analysis. Assuming a medium effect size (w = 0.3), 80% power, and a 0.05 alpha level, the minimum required sample size was calculated as 88. Statistical analyses were conducted using SPSS version 26.0. Descriptive statistics were presented as frequencies and percentages for

categorical variables, and as means, standard deviations, and minimum–maximum values for continuous variables. The Chi-square and Fisher's Exact tests were used for categorical comparisons. The Shapiro-Wilk test assessed normality. Logistic regression and ordinal logistic regression tests were used to understand the relationship between variables. A *p*-value < 0.05 was considered statistically significant.

RESULTS

A total of 101 poisoning cases from suicide attempts were evaluated: 83 (82.2%) female, 18 (17.8%) male, mean age 15.5 ± 1.3 years. Ninety-one were students and 10 employed. Following presentation, 8 (7.9%) were admitted to intensive care, 5 (4.9%) to the pediatric ward, and 88 (87.1%) treated and discharged from the emergency unit.

In 45 cases (44.6%), patients used their own medications. The most frequent were nonsteroidal anti-inflammatory drugs (NSAIDs) (n = 28, 19.6%), analgesics (n = 26, 18.2%), antipsychotics (n = 21, 14.7%), and antidepressants (n = 19, 13.3%). Mean time from ingestion to hospital arrival was 3.8 ± 4.8 hours. Symptoms occurred in 57 patients (56.5%), mainly nausea/vomiting (n = 24, 42.2%). Tobacco and/or alcohol use was reported in 38 cases (35.5%). Sixty-three patients (62.4%) had no medical conditions; 32 (31.6%) had psychiatric diagnoses: major depressive disorder (n = 10), bipolar disorder (n = 9), anxiety (n = 8), attention deficit disorder (n = 4), and anorexia nervosa (n = 1). Other diagnoses (n = 6) included familial Mediterranean fever, arrhythmia, epilepsy, and migraine. Previous suicide attempts were reported by 44 patients (43.6%). The number of siblings ranged from 1 to 7. Socioeconomic status was low in 36 cases, moderate in 44, and high in 21 (*Table 1*). Emotional distress and family-related problems were the most cited reasons for self-harm; financial issues were least reported (*Table 2*).

Twenty-five families (24.8%) had divorced parents. Primary school education or less was completed by 45.5% of mothers and 35.6% of fathers. In 59 families (58.4%), at least one parent used tobacco and/or alcohol. In 31 families (30.7%), a psychiatric disorder was diagnosed in at least one member, most often the mother (n = 18, 58%). Poor family communication was seen in 74 cases (73.3%). Parenting styles were authoritarian (36; 35.6%), permissive/neglectful (32; 31.7%), protective (17; 16.8%), and democratic (16; 15.8%) (*Table 3*). Poor communication occurred most in the authoritarian group (31; 86.1%), followed by protective (14; 82.3%), permissive/neglectful (20; 62.5%), and democratic (9; 56.2%). Differences between groups were significant, due to the authoritarian style (p = 0.046).

The severity of suicidal ideation was assessed using the BSS: group 1 (low, n = 28; 27.7%), group 2 (moderate, n = 25; 24.8%), and group 3 (high, n = 48; 47.5%). AFAS showed no significant difference between avoidant (n = 24; 23.7%), anxious/ambivalent (n = 35; 34.7%), and secure (n = 42; 41.6%) friendship attachment groups (p = 0.064). No significant associations were found with psychiatric disorder, substance use, family psychiatric history, parental marital status, or socioeconomic status. The severity of suicidal ideation was significantly associated with previous suicide attempts (p < 0.001) and borderline with poor family communication (p = 0.050) (*Table 4)*. Ordinal logistic regression identified previous attempts (OR = 4.267, p = 0.003) and poor family communication (OR = 3.218, p = 0.011) as significant predictors.

Recurrent suicidal ideation was observed in 27 patients (26.7%), while 74 (73.3%) did not. The severity of suicidal ideation differed significantly between these groups (p = 0.022). Among patients with recurrent suicidal ideation, 2 (7.4%) were classified in Group 1 (low severity), 9 (33.3%) in Group 2 (moderate severity), and 16 (59.3%) in Group 3 (high severity). In contrast, among those without recurrent suicidal ideation, 26 patients (35.2%) were in Group 1, 17 (22.9%) in Group 2, and 31 (41.9%) in Group 3. Smoking or alcohol use was present in 16 (59.3%) with recurrent suicidal ideation versus 22 (29.7%) without such ideation (p = 0.007). Recurrent suicidal ideation was observed in 19 (43.2%) of the 44 patients with a history of previous suicide attempts, compared to 8 of the 57 patients (14.0%) without such a history (p = 0.001). Logistic regression showed substance use (cigarette/alcohol) as a significant predictor of recurrent suicidal ideation (OR = 3.093, p = 0.025).

During follow-up, 60 patients (59.4%) attended outpatient visits; 20 received psychiatric diagnoses: 8 (40%) major depressive disorder, 4 (20%) bipolar disorder, 4 (20%) anxiety, 2 (10%) psychotic, and 2 (10%) attention-deficit/hyperactivity disorder.

Table 1. Demographic, clinical, and toxicological features of adolescents

	n (%) / mean ± SD / (min-max)
Age (years)	15.5 ± 1.3 (12-17)
Gender	
Male	18 (17.8)
Female	83 (82.2)
Employment status	
Student	91 (90.1)
Worker	10 (9.9)
Time of presentation since exposure (hours)	3.8 ± 4.8 (1-33)
Source of medication	
Prescribed to self	45 (44.6)
Prescribed to someone else	56 (55.4)
Drug class	
Nonsteroidal anti-inflammatory	28 (19.6)
Painkillers	26 (18.2)
Psychotropics	40 (39.6)
Antibiotics- antiparasitics	19 (18.8)
Vitamins-minerals	8 (7.9)
Nervous system drugs	17 (16.8)
Cardiovascular agents	2 (1.4)
Antidiabetics	2 (1.4)
Antirheumatic	1 (0.7)
Cilinical presentation	
Symptomatic	57 (56.5)
Asymptomatic	44 (43.5)
Outcome	
Discharged	88 (87.1)
Inpatient	13 (12.9)
Existing psychiatric condition	
Yes	32 (31.6)
No	69 (68.4)
Prior suicide attempt	
Yes	44 (43.6)
No	57 (56.4)
Smoking/Alcohol Consumption	
Yes	38 (37.6)
No	63 (62.4)
Socioeconomic status	
Low	36 (35.6)
Moderate	44 (43.6)
High	21 (20.8)
Number of siblings	2.8 ± 1.3 (1-7)

Table 2. Self-reported reasons and motivational factors for suicide attempts in adolescents

Underlying motivations	Cases	
	n	%
Internal emotional distress	31	30.7
Family-related problems	28	27.7
Problems with opposite sex	15	14.9
Peer-related problems	11	10.9
Exam anxiety	10	9.9
Financial difficulties	6	5.9
Total	101	100

Table 3. Sociodemographic and psychological characteristics of families with adolescent suicide attempts

		n (%)
Marital status of parents		
	Married	76 (75.2)
	Divorced	25 (24.8)
Education level of mother		
	Elementary school	46 (45.5)
	High school	40 (39.6)
	University	15 (14.9)
Education level of father		
	Elementary school	36 (35.6)
	High school	52 (51.5)
	University	13 (12.9)
Smoking/Alcohol consumption		
	Yes	42 (41.6)
	No	59 (58.4)
Psychiatric condition in family		
	Yes	31 (30.7)
	No	70 (69.3)
Prior suicide attempt in family		
	Yes	23 (22.8)
	No	78 (77.2)
Family communication		
	Good	27 (26.7)
	Poor	74 (73.3)
Parenting styles		
	Authoritarian	36 (35.6)
	Permissive / Neglectful	32 (31.7)
	Protective	17 (16.8)
	Democratic	16 (15.8)

Table 4. Clinical, behavioral, and family risk factors associated with the severity of suicidal ideation

	Severity of self-harm ideation (n/%)				
	Group 1	Group 2	Group 3	Total	p
Previous suicide attempt					
Yes	4 (3.9)	11 (10.9)	29 (28.7)	44 (43.6)	<0.001
No	24 (23.7)	14 (13.8)	19 (18.8)	57 (56,4)	
Existing psychiatric condition					
Yes	7 (6.9)	6 (5.9)	19 (18.8)	32 (31.7)	0.193
No	21 (20.8)	20 (19.8)	28 (27.7)	69 (68.3)	
Smoking/Alcohol Consumption					
Yes	7 (6.9)	8 (7.9)	23 (22.8)	38 (37,6)	0.158
No	21 (20.8)	17 (16.8)	25 (24.7)	63 (62,4)	
Family communication					
Good	12 (11.9)	7 (6,9)	8 (7.9)	27 (26.7)	0.050
Poor	16 (15.8)	18 (17.8)	40 (39.6)	74 (73.3)	
Psychiatric condition in the family					
Yes	4 (3.9)	11 (11.9)	16 (15.8)	31 (30.6)	0.066
No	24 (23.7)	15 (14.8)	31 (30.6)	70 (69.3)	
Parental marital status					
Divorced	3 (2.9)	7 (6.9)	15 (14.8)	25 (24.7)	0.115
Married	25 (24.7)	18 (17.8)	33 (32.6)	76 (75.3)	
Socioeconomic status					
Low	11 (10.9)	10 (9.9)	15 (14.8)	36 (35,6)	0,636
Moderate	13 (12.8)	11 (11.9)	20 (19.8)	44 (43,6)	
High	4 (3.9)	4 (3.9)	13 (12.8)	21 (20,8)	

DISCUSSION

According to WHO data, suicide accounted for 1.3% of all global deaths in 2019.[1] In Turkey, the Turkish Statistical Institute (TUIK) reports that suicide-related deaths rose from 1802 in 2000 to 4146 in 2022, with the crude suicide rate increasing from 2.80 to 4.88 per 100 000 population.[16] Although concerning, suicide attempts are estimated to occur 10-20 times more frequently than completed suicides.[17]

While the WHO reported a 36% global decrease in age-standardized suicide rates from 2000 to 2019, rates in the United States rose by 17%. In 2019, suicide was the second leading cause of death in those aged 15–24.[1,5,] In Australia, it accounted for 31.8% of deaths in ages 15–17, 33.1% in 18–24, and 2% in children under 14. Suicide rates are low under age 12 but tend to rise until age 15, then plateau after 17.[1,17,18] In Turkey, 2022 TUIK data show 2% of suicide deaths in those under 15 and 9.9% in ages 15–19.[19] This trend aligns with our study, where the mean age was 15.5 ± 1.3 years.

Increased adolescent psychopathology, academic stress, career uncertainty, military duties for males, limited life experience, poor crisis management, and peer issues may contribute to suicidal behavior in this age group. Gender differences in suicidal behavior typically emerge during adolescence. While males have higher rates of completed suicide globally, females attempt more often.[17,20,21] In line with prior research, 82% of our cases were female. This disparity may relate to males' reluctance to express emotional distress, preference for more lethal methods, and traditional gender role influences. In Turkey, the most common methods among 15–19-year-olds who died by suicide were hanging (30.2%), firearms (25.6%), jumping (22.2%), and chemical or drug ingestion (15.9%).[19] Non-fatal attempts most often involve drug poisoning with accessible household drugs, particularly NSAIDs, paracetamol, and antidepressants.[22,23] In our study, all suicide attempts involved drug ingestion, most commonly psychotropic medications and NSAIDs. Notably, 44.6% of patients used their own medications. The ease of access to drugs that should be supervised by parents is concerning. Previous studies have linked low parental education to poisoning cases.[24] In our sample, 45.5% of mothers and 35.6% of fathers had only completed primary education. This high proportion underscores the critical importance of parental education in the prevention of such incidents.

In our study, 35.6% of families had income at or below the minimum wage, yet only 5.9% of patients linked self-harm to financial difficulties. No significant association was observed between income level and suicidal ideation severity. According to WHO reports, although youth suicide rates vary across countries, approximately 80% of all suicides occur in low- and middle-income countries, partly because the majority of the global population lives in these regions.[1] Although economic hardship is a risk factor in developing countries, high suicide rates in wealthy societies and varying study results suggest the link between income and suicide is complex and shaped by broader societal dynamics.

Parental divorce, psychiatric illness, and poor parent-child relationships are known familial risk factors.[25,26] In Turkey, the divorce rate is 2.19 per 1000.[27] In our study, 24.8% of cases had divorced parents—above the national average—and the divorce rate was higher in Group 3, where the severity of suicidal ideation was high. Psychiatric disorders within the family can undermine emotional cohesion, with maternal mental health most affecting a child's psychosocial development.[26] In our study, 22.8% had a family suicide history, and psychiatric conditions occurred in 31 families (30.7%), with mothers affected in 58%.

Authoritarian or neglectful family structures are recognized risk factors contributing to insecure attachment.[28] In our study, authoritarian and permissive/neglectful parenting styles were the most prevalent. Family-related problems were the most frequently reported reason for suicidal behavior (27.7%), and poor family communication was identified in 73.3% of cases. In the authoritarian family style, poor family communication and greater severity of suicidal ideation were significantly more common compared to other parenting styles. Additionally, ordinal logistic regression analysis demonstrated that poor family communication was a significant predictor of the severity of suicidal ideation (OR = 3.218). These findings clearly highlight the contribution of problematic parenting and dysfunctional family communication to the development of suicidal behavior.

Previous research has demonstrated that psychiatric disorders such as depression, anxiety, and emotional dysregulation, as well as a history of prior suicide attempts, are frequently associated with suicidal ideation. A history of suicide attempts is reported in 25–33% of

individuals who engage in suicidal behavior, and its presence is a strong predictor of future risk.[26,28,29] In our study, 31.6% of patients had a pre-existing psychiatric disorder—most commonly depression—and 43.6% had a history of at least one suicide attempt. Patients with a history of suicide attempts were significantly more likely to have recurrent suicidal ideation compared to those without such a history. Moreover, similar to poor family communication, a history of previous suicide attempts was identified as a significant predictor of the severity of suicidal ideation (OR = 4.267). These findings are consistent with prior research indicating that individuals with a history of suicide attempts are at substantially increased risk for, and exhibit greater severity of, subsequent suicidal thoughts.

Impaired peer relationships in children are associated with problematic behaviors later in life, such as aggression, substance use, and delinquency. Therefore, difficulties in interactions with peers and close social circles have also been linked to suicidal behavior.[30] However, in our study, no significant relationship was found between the severity of suicidal ideation and peer attachment styles. Future studies may consider using alternative relationship-focused instruments to better assess the qualitative aspects of peer interactions in adolescents.

Substance use within the family negatively impacts communication and, through behavioral modeling, can lead to increased tobacco and alcohol use among adolescents. Furthermore, repeated suicide attempts have been reported more frequently among individuals who use substances.[2,31] In our study, tobacco and/or alcohol use was identified in 37.6% of all cases, and 58.4% of parents. In patients with high suicidal ideation severity, tobacco/alcohol use was found to be 47.5%. Both recurrent suicidal ideation and a previous suicide attempt were associated with tobacco/alcohol use. Additionally, logistic regression analysis showed that tobacco/alcohol use was a significant predictor of recurrent suicidal ideation (OR = 3.093). These results confirm that substance use, which can increases aggression by impairing cognitive processes and judgment, is an important risk factor, especially for adolescents with underlying psychiatric disorders.

This study has several limitations. First, the findings may not be generalizable to all sociocultural segments of the population. Second, the cross-sectional design precluded long-term patient follow-up.

CONCLUSIONS:

Poor family communication, authoritarian family style, psychiatric disorders, and substance use are closely associated with suicidal ideation in adolescents. In addition, previous suicide attempts and poor family communication emerge as key risk factors that increase its severity. Therefore, early psychiatric interventions targeting dysfunctional family dynamics and substance use should be considered essential components of multidimensional strategies to prevent suicidal behavior in at-risk youth. ■

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