

# Evaluation of Predictors of Suicidal Re-Attempt in Pediatric Patients in the Emergency Department

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## Abstract

**Background:** Suicidal attempt in children is a serious public health problem. A proper identification of features of suicide-related behavior may help physicians to develop an accurate approach. The aim of this study was to clarify the characteristics of children with poisoning due to suicidal attempt and to determine the risk factors of suicidal re-attempt in the Emergency Department (ED) via a simple questionnaire. **Methods:** We collected medical data of patients under 18 years who were admitted to our ED with intoxication due to suicidal attempt, retrospectively. General characteristics of patients were evaluated. Patients were divided into 2 groups as 1) High risk: patients with repetitive suicide attempt; 2) Low risk: patients with first time suicidal attempt. **Results:** A total of 57 patients were included in this study. The mean age was  $15.91 \pm 0.97$ . Majority of the patients were female (73.7%). Analgesics were the most frequent abused drugs with a ratio of 51.1%. It is determined that the most important variables affecting the risk of suicidal re-attempt are “idea about the suicide” and “purpose”. It was determined that patients with an idea of repetitive suicide (I will try again) and whose purpose was to die (I wish I have died) were in the most risky group with a history of previous suicidal attempt. **Conclusion:** This study suggests that answers of the pediatric patients to some question have a potential to predict the high risk patients. The risk of suicidal re-attempt may be predicted by the answers given to these questions: 1) What is your idea about suicide? 2) What was your purpose?

## Keywords

Suicide, Pediatric Patients, Emergency Department

## 1. Introduction

Suicide claims the lives of ten thousands of young people worldwide, annually [1]. Although the rates vary between countries, suicide is one of the leading causes of death among young people [2]. Suicidal attempts in children have a high prevalence and its risk factors are well-known. However, suicidal behavior in many children and adolescents is often undetected by parents, teachers and health care providers [1]. Despite the increase in Emergency Department (ED) presentation rates, there has been a decrease in hospitalization after the attempt. This finding results with the increasing importance of the EDs for evaluation and stabilization of the suicidal patients. EDs also have an increasing role for initiating follow-up care to reduce subsequent crises [3] [4]. Recent studies reveal usefulness of such questionnaires in detection of depressive status and suicide ideation of adolescents [5] [6]. The lack of determination of patient with high risk for re-suicidal attempt may result in undesired clinical outcomes. Screening tools such as questionnaires are helpful to identify suicide risk in children whose thoughts and behaviors may have gone undetected [7] [8].

Risk factors for suicidal attempt are known to be previous suicide attempt, violence victimization, violence perpetration, alcohol use, marijuana use, and school problems [9].

Among these, the most important correlate for youth suicide is a previous attempt [10] [11] [12].

The aim of this study was to assess the general features of children with first time and repetitive suicidal self-poisoning attempt, and to determine the prominent factors related with re-suicide attempt in the ED.

## 2. Methods

Medical records of pediatric patients (age < 18) with self-poisoning attempt, admitted ED of Hitit University Çorum Training and Education Hospital between January 2012 and January 2013, were evaluated retrospectively. The study protocol was approved by the local ethics committee.

A standard evaluation form gathered from a chart review was used in the study on admission. This form is approved by Health Directory and applied every pediatric patient admitted due to suicidal attempt. In the form; the relationship with the parents, the reasons of suicide, the history of previous attempts, previous treatments, the thought of repetitive suicidal attempt and other diagnoses of mental and organic diseases were determined. All patients included into the study have completed the questionnaire as volunteers. After emergency care, all patients were evaluated by pediatric psychiatrists in the ED. Exclusion criteria were patients with altered mental status on admission, age older than 18 years, inability to speak and inadequate evaluation and firearm related suicides. Patients were divided into 2 groups as 1) High risk: patients with repetitive suicide attempt; 2) Low risk: patients with first time suicidal attempt [13].

For the analysis of data, Statistical Package for the Social Sciences (SPSS) 17.0

programme was used. By obtaining the frequency distribution of the variables, we discussed the reasons of the suicidal attempts and aimed to reveal the predictors of suicidal re-attempt. For dual comparisons, Chi-square test was used and the patients under the risk of suicidal re-attempt were tried to be determined. P values < 0.05 was considered significant.

### 3. Results

A total of 57 patients with suicide attempt were enrolled in the study. The mean age was  $15.91 \pm 0.97$ . Majority of the patients were female (73.7%). The demographical data of the patients are shown in **Table 1**.

There were 12 patients (21%) in high risk group and 45 patients (79%) in low risk group. It was found that majority of the 57 patients were living with their parents (82.5%). When reasons of suicide were assessed, the patients expressed, respectively, medical illnesses (29.8%), parental conflicts (17.5%), puberty problems (17.5%), problems with school (14%), and psychiatric illnesses (14%). Only 1 patient had alcohol and drug abuse problem. In the majority of the patients (89.5%), a parental psychiatric problem or a history of suicide was determined. While 63.2% did not have a recent psychiatric diagnosis, 26.3% had a diagnosis of depression and 10.6% had other psychiatric diagnoses.

Significant differences between high risk and low risk groups in respect to demographic and psychiatric evaluation are shown in **Table 2**. It was determined that most of the patients admitted in winter were in low risk group. According to the period between suicidal attempt and admission on ED, a statistically significance was determined between the groups. We found that patients in high risk group preferred night for suicidal attempt. Most of the patients in high risk group had psychiatric disorder. Most of the patients in low risk group were living with their family. When groups were compared according to ideation and purpose of suicide, majority of the patients who said "I will try again" and all of the patients who said "I wish I have died", respectively, were involved in high risk group. Most of the patients in low risk group did not plan the suicide. Short period of presence of suicidal reasons (for 3 months) were remarkable for low risk group. It was also determined that number patients in high risk group claiming that they were not regretful, they would try to kill themselves again and wish they have been dead were significantly higher when compared to low risk group.

### 4. Discussion

Suicidal attempt by drug ingestion is a life-threatening and challenging health problem among children and adolescents. It is known that, only in the United States, in 2001, more than 1 million children and adolescents commit suicide. It is also estimated that greater number of youth are preoccupied with suicidal thoughts [14] [15] [16] [17].

There are many studies in the literature, investigating a brief and easy-to-use

**Table 1.** General characteristics of pediatric patients with suicidal attempt.

Characteristics	n	%
<b>Age (y)</b>		
14	3.0	5.3
15	20.0	35.1
16	13.0	22.8
17	21.0	36.8
<b>Sex</b>		
Male	15.0	26.3
Female	42.0	73.7
<b>Educational status</b>		
In primary school	3.0	5.3
In high school	41.0	71.9
Literate	1.0	1.8
Primary school graduate	11.0	19.3
High school graduate	1.0	1.8
<b>Seasons of suicide</b>		
Spring	7.0	7.0
Summer	17.0	29.8
Autumn	14.0	24.6
Winter	22.0	38.6
<b>Time of suicide</b>		
Morning	4.0	7.0
Afternoon	20.0	35.1
Evening	27.0	47.4
Night	6.0	10.5
<b>Period between suicide attempt and arrival on ED</b>		
1 hour or less	30.0	52.6
Between 1 and 2 hours	14.0	24.6
Between 2 and 6 hours	11.0	19.2
1 day after	1.0	1.8
2 days after	1.0	1.8
<b>Type of drug</b>		
Analgesics	19.0	33.3
Antibiotics	3.0	5.3
Antidepressant	12.0	21.1
Antihypertensives	3.0	5.3
Others	20.0	35.0
<b>Psychiatry consultation</b>		
Yes	52.0	91.2
No	5.0	8.8
<b>Diagnosis of psychiatry in ED</b>		
Depression	27.0	47.4
Behavior disorder	2.0	3.5
Anxiety	1.0	1.8

**Continued**

Alcohol and drug abuse	1.0	1.8
Bipolar disorder	1.0	1.8
Conversion	1.0	1.8
None	24.0	42.1
<b>Outcome</b>		
Hospitalized	54.0	94.7
Discharged from the ED	3.0	5.3
<b>Duration of hospital stay</b>		
Discharged the same day	1.0	1.8
1 day	11.0	19.3
2 days	27.0	47.4
3 days	12.0	21.1
4 days	60.0	10.5
<b>Life status</b>		
Living with parents	47.0	82.5
Living with a brother/sister	1.0	1.8
Living in a nursery	1.0	1.8
Separated parents	8.0	14.0
<b>Reasons of suicide attempt</b>		
Parental conflict	10.0	17.5
Problems related to puberty	10.0	17.5
Medical illness	17.0	29.8
Problems related to school	8.0	14
Problems with the opposite sex	2.0	3.5
Alcohol and drug addiction	1.0	1.8
Psychiatric problems	9.0	15.8
<b>Family history</b>		
None	51.0	89.5
Psychiatric problems	2.0	3.5
Suicide attempt	3.0	5.3
Death related to suicide	1.0	1.8
<b>History of psychiatric illness</b>		
None	36.0	63.2
Depression	15.0	26.3
Behavior disorder	1.0	1.8
Anxiety	2.0	3.5
Psychosis	1.0	1.8
Conversion	2.0	3.5
<b>History of suicide attempt</b>		
None	45.0	78.9
In one year	10.0	17.5
Before one year	2.0	3.5
<b>Duration of suicide related problem</b>		
Less than 6 months	45.0	78.9

## Continued

6 months or more	12.0	21.1
<b>Purpose</b>		
Call for help	52.0	91.2
Desire of death	5.0	8.8
<b>Did he/she mention suicidal thought before</b>		
No	55.0	96.5
Yes	2.0	3.5
<b>Is there a note of suicide</b>		
No	56.0	98.2
Yes	1.0	1.8
<b>Thoughts after the suicide attempt</b>		
I wish I have died	1.0	1.8
I am regretful	50.0	87.7
I will try again	6.0	10.5

**Table 2.** Comparison of demographic and psychiatric evaluation of high and low risk groups.

	High risk n (%)	Low risk n (%)	p
<b>Seasons of suicide attempt</b>			
Spring and summer	6 (28.6)	15 (71.4)	
Autumn	5 (35.7)	9 (64.3)	
Winter	1 (4.5)	21 (95.5)	0.047
<b>Period between suicide attempt and arrival on ED</b>			
Between 0 and 8 hours	10 (18.2)	45 (81.8)	0.041
Longer than 8 hours	2 (100)	0 (0)	
<b>Time of suicide attempt</b>			
Morning, afternoon and evening	8 (15.7)	43 (84.3)	0.015
Night	4 (66.7)	2 (33.3)	
<b>Previous psychiatric diagnosis</b>			
No	4 (11.1)	32 (88.9)	0.022
Yes	8 (38.1)	18 (61.9)	
<b>Living situation</b>			
Living with parents	8 (16.7)	40 (83.3)	0.082
Living in nursery or parents separated	4 (44.4)	5 (55.6)	
<b>Thoughts after suicide</b>			
I am regretful	6 (12.0)	44 (88.0)	<0.001
I will try again	6 (85.7)	1 (14.3)	
<b>Purpose of suicide</b>			
Call for help	7 (16.7)	45 (83.3)	<0.001
I wish I have died	5 (100)	0 (0.0)	
<b>Planned suicide?</b>			
No	6 (50.0)	6 (50.0)	0.012
Yes	6 (13.3)	39 (86.7)	
<b>Period of presence of suicidal reasons</b>			
For 6 months	6 (13.3)	39 (87.7)	0.012
6 months or longer	6 (50.0)	6 (50.0)	

High risk: Previous suicide attempters, Low risk: First time suicide attempters.

survey that can be applied in the ED. Horowitz *et al.* developed a 14-item screening survey called “the Risk of Suicide Survey” (RSQ) in 2001 and found that combination of 4 items (current suicidal behavior, past suicidal ideation, past self-destructive behavior and current stressors) had the highest sensitivity [18]. Lately in 2012, they developed a 4-question screening instrument, the Ask Suicide-Screening Questions (ASQ). They reported that this survey, with its high sensitivity and negative predictive value, could identify the risk for suicide in patients presenting to ED [19]. Also, there are surveys like “Adolescent and Child Urgent Threat Evaluation” (ACUTE) which are designed to determine the children under risk [20]. In some countries screening tools are also used in schools. “Columbia Suicide Screen”, “Suicide Risk Screen” and “Sign of Suicide Programme” can be given as examples [1].

Studies have shown that as many as 83% of the suicide attempters are not identified as a danger to themselves by clinicians, even when examined by primary care clinicians months before their attempt [21] [22]. These findings reveal the importance of screening of suicidal children in the ED. Prevention of suicide and other risky behavior may be best accomplished through routine and systematic screening for suicide risk factors [23].

From 1950 to 1990, the suicide rates among adolescents in the 15- to 19-year-old group have increased about 300% [24]. Besides, in the same age group, females are affected 6 times greater than males [25]. In our study, accordingly, we observed that majority of the patients were female (81.1%). In pediatric age group, number of cases increases by the age [2] and our study is compatible with the literature at this point. In the literature, it is reported that firearms are used in more than 67% of the cases and are the leading cause of death in suicidal attempts [26]. However, we have to remind that firearms kept in the house, even if they are stored locked or unloaded, are associated with high risk for adolescent suicide [13]. Clinicians must warn parents about the lethality of firearms and advice them strongly to remove them from the premises [27].

Naturally, great majority of our patients were students. So, this finding makes school an important place for early detection and prevention of suicide. A universal screening which involves administering a test to a population regardless of individual risk factors or symptomatic presentation is essential. A targeted screening which involves a test administered only to individuals manifesting particular symptoms or risk factors can also be implemented. In countries considering pediatric suicide an important public health problem to solve, suicide screening is being gradually integrated into schools, primary care centers and EDs [1].

Physical illnesses are commonly observed in young people who attempt suicide [13]. Accordingly, in our study, with a rate of 29.8%, medical illness was told by the patients to be the most common cause of suicide. It was followed by problems in the school and parental conflict. Although it is known that alcohol and drug abuse contribute to risk of suicide [28], in our study, only 1 patient admitted that he had alcohol/drug addiction problem.

The strongest predictor of suicide is the history of a previous suicide attempt [13] [20] [29]. In a survey study, a single item from the Youth Risk Behaviour Survey (YRBS) was used to classify suicide risk: "During the past 12 months, how many times did you actually attempt suicide?" [17]. Similarly, we divided the patients into two groups as high risk and low risk.

In our study, most of the patients in high risk group had psychiatric disorder. Although identification of suicidal persons is not possible by a single test, some specific factors like history of depression, previous suicide attempt, a family history of psychiatric disorder or suicidal behavior, family disruption, certain chronic or debilitating physical disorders or psychiatric illness, exist [30]. The link between suicidal behaviour and depression is well established. Depression has been shown to increase risk of suicide and repeated suicide attempt. Up to 85% of the patients with major depressive disorder or dysthymia are thought to have suicidal ideation and 32% are thought to make a suicide attempt during adolescence or young adulthood [28]. In our study, 15 patients (26.3%) had a history of depression and a depression diagnosis was made in 27 patients (47.4%), which is an important result that reveals the relation between depression and suicide.

In our study, most of the patients in low risk group were living with their family. Family factors are also associated with suicide risk in pediatric patients [16]. A strong and convergent evidence that suicidal behavior is familial, and perhaps genetic, has been determined. It was also reported that suicidal behavior was transmitted in family's independent from psychiatric disorders [31]. In our study, parents of 8 children were separated and 2 patients had parents with a history of psychiatric problem. Also, parents of 3 patients had a history of suicide attempt. A physician dealing with this group of patients must consider psychiatric support for the family, as well.

According to our results, "what is your idea about the suicide?" and "what was your purpose?" are the main predictor questions of suicidal re-attempt. The majority of the patients in high risk group answered: "I will try again" and "I wish have I died" to these questions. It was also determined that risky patients do not commit suicide with a sudden decision but they plan it for a long time. In a two-tier brief screening tool including 4 questions to determine the children under suicidal risk developed by Wintersteen *et al.*, the final question is: "In the past week including today, have you made plans to kill yourself?" [20]. So, we may say that attempts with a plan are more risky than those resulting from a sudden decision.

Patients under risk of re-attempt also declared that the reasons that drag them to suicide have been affecting their lives for more than 6 months. In a study, increasing duration of exposure to a single-parent household before the age of 16 years was found to be significantly associated with higher rates of anxiety disorder between the ages of 21 - 25 years. Duration of exposure, however, was not significantly associated with suicidal ideation or attempted suicide [32]. Further studies for the affect of other risk factors on suicidal risk are needed. So, "was it a

sudden decision?” and “how long have the reasons of suicide been affecting your life?” are the secondary questions to reveal the risk of suicidal re-attempt. Compatible with the literature, other risky children are determined as those with a previous psychiatric diagnosis and those with separated parents [28].

## 5. Conclusions

Emergency Departments are promising venues for identifying youth at risk of suicidality. For many youths, EDs are unique places where they can contact a health-care provider who can intervene or refer to outside resources. The ED setting may be suitable for managing suicidality risk and there is a need for a brief screening tool which may initiate a more detailed evaluation of the patients [1].

In this article, as a contribution to these studies, we sought for important questions which may be asked in ED in order to determine children at risk of suicidal re-attempt. By asking some simple questions, we think that we can obtain important clues about children who may visit ED with suicidal re-attempt.

We believe that such screening tools may be applied to EDs and schools. As reports reveal that pediatric patients support screening after being asked a number of suicide-related questions in the ED [33], we, as ED physicians, must contribute to determination of children at risk of suicidal re-attempt.

## Limitations

Our study also has some limitations. A larger group of pediatric patients with suicidal attempt would have given more accurate results and outcomes. Besides, inclusion of medical histories of patients who have died following suicidal attempt could have led to a better understanding of suicidal ideation of pediatric and adolescent patients.

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