Identifying the affecting factors in adolescents who attempt suicide

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Abstract
Aim: Suicides and suicide attempts in adolescents are important public health concerns increasing day by day. The most effective way of preventing suicides is to identify risk factors and take necessary measures before the suicidal behavior turns into action. This study is of descriptive type. It was performed in a Children's Hospital in Ankara aiming to identify the risk factors of committing a suicide in adolescents between 13 and 18 years of age, who carried out a suicidal attempt. Material and Method: There are two groups within the study. These are the suicidal attempt group and the comparing group. The data were collected through the ‘Data Collecting Form’. Statistical analyses were performed using the software SPSS package program (SPSS for Windows, Version 25.0, IBM Corporation, Armonk, New York, United States). Results: The adolescents, who have a good relationship with parents, who have a good relationship with friends, whose opinion is asked for about family decisions, and whose mother and father live in the same house have less tendency and risk for committing suicide (p<0.05). Discussion: The reason of suicide attempts is mostly familial factors. Risk screening for suicide attempt in adolescents should be carried out particularly at schools, courses, adolescent clinics, and services. Those in the risk group should also be consulted for professional support in an early period.

Keywords
Adolescent; Hospital; Risk Factors; Suicide

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Suicide attempt

Introduction
According to the data from the World Health Organization (2013), one million people lost their lives by committing suicide and the rate of suicide in the young population gradually increased. Although one person in every 40 seconds commits suicide in the world, suicide attempts are 20 times higher than this rate. Suicides are the second leading cause of deaths among those between 10 and 24 years of age. Deaths from suicides are estimated to reach 1.5 million in 2020. According to the data from the Turkish Statistical Institute (TUİK) (2015), the number of suicides resulting in death is 3211 in 2015, in Turkey. Among individuals who committed suicide, 34.3% are between 15 and 29 years of age that includes the adolescence period. The reason for this issue is that the adolescence, one of the most important periods, during which the child grows up in terms of physiological, psychological, sexual and identity development [1]. Besides, the issues and problems from childhood period are solved during this period. Finding a solution to these issues and problems is also harder than they are thought [2]. Suicide means intentionally killing oneself, and it includes self-damaging. If the individual has not lost his/her life, then this action is named suicide attempt [3]. It is of much importance to identify the risk group and take necessary measures to prevent injuries and death before the suicide attempt turns into action [2].

It is impossible to decrease or resolve the suicide attempts without understanding the relationship between adolescent suicides and biological, psychological, social, environmental and sociocultural factors [1, 2]. Studies in the literature mostly deal with adult age groups and usually include only individuals has attempted suicide. For this reason, only the studies covering a specified age group and comparing suicidal groups with normal ones could provide an insight into the problem. This study was carried out to identify the factors driving adolescents into suicide by comparing the traits of suicide-committing adolescents with normal ones.

Material and Methods
The study is of the comparative descriptive type and it was composed of two groups. These are the suicidal attempt group (n=100) and the comparing group (children applying to the clinic due to complaints other than the suicide attempt) (n=100). The study was carried out in the emergency unit of a children's hospital in Ankara between November 2015 and March 2016. The population of the study is composed of two different adolescent groups admitted to the Paediatric Emergency Service between November 2015 and March 2016. One of the groups was composed of 100 children, who were taken to the emergency service due to a suicide attempt. The children in this group voluntarily took part in this study. The other group was comprised of 100 children, as well, who were taken to the emergency service due to health complaints other than a suicide attempt. These children as those in the first group voluntarily took part in this study as well.

Power analysis was used to determine the sample size. It was detected that 32 children in suicide attempt group and 44 children in the comparing group should be reached when α accepted as = 0.05, and β as = 0.20 However, the study was planned to include 100 children for each group.

Sample selection criteria were determined as follows: the child must be aged between 13 and 18 years, not to be mentally retarded, his/her consciousness must be open and/or verbal communication can be established with him/her, family and/or child should not become agitated, the child's clinical situation and the interventions performed are appropriate for data collection, voluntary participation of the child and his/her family must be in the research.

The data were collected through Data Collecting Form (39 questions in total). The data collecting form was developed by the researcher with the aim of identifying informative traits of children between 13 and 18 years of age and their families, the general state of health of children, attitudes and behaviour of parents towards adolescents, and attitudes of children towards committing suicide. In order to ensure the content validity of the survey, specialist opinions were taken from three persons, one of whom was a Child Psychiatrist (PhD), the other, a Paediatrician (PhD) and finally, a Public Health Nurse. Survey items were corrected based on the suggestions. Then, a preliminary study was conducted with a group of 10 people aged between the ages of 13 and 18 by the Child Psychiatrist, and the survey form was given its final shape in parallel with the feedbacks. The survey forms completed in the preliminary study were not included in the research.

The aim of the study was not only to define informative traits of children between 13 and 18 years of age and their families but also revealing children's general health state, attitudes, and behavior of families towards children, attitudes of children towards committing suicide. Emergency Department, which is the research unit, consists of triage, observation room, intervention room, a resuscitation room, Ventolin room, treatment room and polyclinics (3 units). The observation room has a capacity of 12 beds and has 1 isolated room. The first intervention of patients who come to Pediatric Emergency due to suicide attempt is performed in the Emergency Service Intervention Room. The treatment and follow-up of the patients continue in the hospital's large children's services where there is no need for intensive care, or in the Emergency Service Observation Room if there is no room in the services. After the clinical status of the child becomes available for data collection, the patient is sent to the psychiatry outpatient clinic and interviewed. When the patient was sent to the psychiatry polyclinic for an interview, data were collected using the face-to-face interview method with Child and Adolescent Psychiatry Specialist. In adolescents (control group) who came for various medical reasons other than a suicide attempt, the data were collected by face to face interview method in the Emergency Service Intervention Room after the medical treatment in the emergency room of the patient. During the application, adolescents participating in the research were informed about the importance of the research in order to ensure that they were honest and sincere in answering the data collection tools. It was paid attention not to be with the family and it was convinced that their information would not be shared with third parties.

SPSS 25.0 (IBM Corporation, Armonk, New York, United States) program was used to analyze the variables. The Shapiro-Wilk test was used to determine the normal distribution of the data. The Mann-Whitney U test was used to compare the groups with respect to age quantitative variables. The Pearson Chi-Square Monte Carlo and Exact results were compared with the Fisher-Freeman-Holton test using the Monte Carlo Simulation technique and the Fisher Exact test was tested according to the Exact results. The rates of the meaningful results were compared with each other and the results of Benjamini-Hochberg corrected p-values were expressed. The quantitative variables
were shown as median (1st Quartile - 3 Quartile) while categorical variables as n (%) on the tables. The variables were examined at 95% confidence level and p-value was accepted as less than 0.05.

**The Ethical Aspect of the Study**

This study started after obtaining ethical approval with 80558721/268 code number from the University of Eskisehir Osmangazi Ethics Committee. Written consent was also obtained from the hospital where the study was carried out. The opinion of the Department of Child and Adolescent Psychiatry of Gülhane Military Medical Academy was asked with the aim of evaluating the appropriateness of the research, and the scale in terms of the age and psychology of the child. Written and oral consent of the adolescent and parents voluntarily involved in the research were obtained after informing them. The study was conducted in accordance with the Second Helsinki Declaration.

**The Limitations of the Study**

Trauma cases (wrist slashing, firearm injuries, jumping off, etc.) due to a suicide attempt that were directly applied in the hospital where the study was conducted were referred to general hospitals. It might reduce the number of cases concerning suicide attempts. During the research period, the cases due to substance-use in Ankara were treated in different hospitals for 5 days in each month. The patients who were substance-users and attempted suicide by using the substance were admitted by the hospital where the study was conducted between the first and fifth days of the month. This practice might decrease the number of suicide attempt cases related to substance use.

**Results**

Table 1 shows the descriptive characteristics of the adolescents in the study and comparing groups and intergroup comparisons. Both groups have similar characteristics in terms of average age, employment status, having a chronic disease, drug abuse, and relationship with sibling(s) (p>0.005), however, there is a difference between the groups with regard to gender, the status of going to school, school success, having a psychological disease, smoking, use of alcohol, relationship with friends, relationship with mother, and relationship with father (p<0.005).

When the diagnosis of those having psychological disorders in the suicide attempt group (n=12) was examined, it was detected that eight of adolescents had the anxiety disorder, three of them had the panic attack, and one of them had attention deficit-hyperactivity disorder (ADHD). In the comparing group, the number of adolescents with psychological illness is 2. While one of them is diagnosed with depression, the other is diagnosed with attention to ADHD.

Table 2 shows the descriptive characteristics of the parents of the adolescents in the study, comparing groups and the comparison between the groups. Both groups have similar characteristics in terms of average family type, family income status, a total number of children in families, and birth-order of the child (p>0.005), however, there is a difference between the groups with regard to parental relationship status (p<0.005).

In our study, according to the information given by the adolescents (n=199) whose father is alive, there is no father who does not work and has a psychological disease diagnosis.

Table 3 shows the attitudes of families in the study and comparing groups towards adolescents and comparison between the groups. Both groups have similar characteristics in terms of average father’s attitude towards the child (p>0.005), however, there is a difference between the groups with regard to mother’s attitude towards the child, and the decision maker of the family (p<0.005).

When the adolescents were asked about the reasons why they attempted suicide, school failure was reported by 18% of them, having argued with father by 15% of them, parental discord by 10% of them, parental pressure by 9% of them, bad relationship with the friends by 8% of them, boredom by 8% of them, having argued and breaking up with the lover by 7% of them, having argued with the mother by 4% of them, quarrel between the siblings by 4% of them, lack of care in the family by 3% of them, divorcement by 3% of them, having a bad relationship with the others by 3% of them, economic troubles, death of father, an instant anger, and detaching from life were determined by the rest of them as the reasons for attempting suicide. When the adolescents attempting suicide (n=100) were asked for their current thought while 66% of them expressed regret for attempting suicide, 21% of them stated that they could attempt suicide again, and the rest of them declared that they were hesitant to do it.

**Discussion**

The study was carried out on adolescents between 13 and 18 years of age. The average age of both the suicide attempt group and the comparing group was 15 years (Table 1). There is a difference between both groups in terms of gender factor and the suicide attempt of adolescents. It was detected that the rate of suicide attempt in females was higher than that of males (p=0.017) (Table 1). Studies [5-12] indicate that the suicide attempts are more frequently seen in females than males in the most countries and this fact may be associated with the place and roles of women in society [11]. Experiencing an oppressive attitude in society and having a more emotional nature may be another reason for the higher rate of suicide attempts in women.

There is a difference between the groups in terms of attending rates to school and suicide attempts of adolescents. All the dropouts are in the suicide attempt group (p<0.001) (Table 1). It was found that the suicide attempt was higher in adolescents who did not attend school than adolescents attending school. The research results are similar to other studies [7, 8]. Higher rates of suicide attempts in adolescents who do not attend school may be linked to negative feelings such as separation from friends, the thought that he/she can not have the profession he wants to do in the future, and the loneliness.

It was detected in the study, that there was a significant relationship between the school success and suicide attempt of adolescents (p<0.001) (Table 1). The rate of the suicide attempt is higher in the group with low school success. This result is similar to that of other studies [5, 8, 13]. This fact reveals that school failure is a risk factor for suicide attempt.

There is no difference between the groups in terms of the presence of chronic disease and suicide attempt (p>0.051) (Table 1). In a study carried out on a similar problem by Hawton et al. [14], it was detected that physical disorders or injuries increase the risk of suicidal behavior in adolescents. The difference of our study result from those in the literature may be linked to the small number of adolescents with chronic disease in our sample group.

Psychiatric disease is present in 14 of the adolescents (n = 200).
While the rate of suicide attempt of adolescents with the psychiatric disease is 85.7% (n=12), it decreases to 47.3% (n=88) in those without a psychiatric disease. This result is statistically significant (p=0.010) (Table 1). In adolescents with psychiatric disorders, suicide attempts were found to be higher than in adolescents without psychiatric disorders. Other studies [4, 15] also support this result. Apart from psychological balance, psychiatric disease which deteriorates physical and social balance can cause an increase in the rate of suicide attempts by negatively affecting adolescents’ ability to cope with problems and their ability to understand, comprehend and think. This result is important because it shows that adolescents with psychiatric disorders are in a risk group for suicide attempts.

There is a significant difference between both groups in terms of smoking and suicide attempt of adolescents (p<0.001) (Table 1). The results are similar to those of other studies [4, 16]. This result reveals that adolescents who are the smokers and sometimes smokers have a higher risk of suicide than those who are not. It was detected that there was a significant difference between both groups regarding alcohol use and suicide attempts of adolescents (p<0.001) (Table 1). The rate of the suicide attempt is higher in the alcohol-using and sometimes alcohol-using group than that of the teetotal group. Other studies [16, 17] also support this relationship. For this reason, adolescents who are the smokers and/or using alcohol should be detected and be assessed for the risk of depression, hopelessness, and a suicide attempt by the nurses and the other health workers. Early diagnosis of the risky group is important to provide treatment before the situation turns into behavior. It was not detected that there was a significant difference between the groups in terms of drug abuse and suicide attempt of adolescents (p=0.097) (Table 1). However, studies in the literature [5, 6, 10, 15, 18] reveal that substance-use takes place at the top of the factors driving adolescents into suicide. The patients who have substance-users’ story were admitted by the hospital where the study was conducted only between the first and fifth days of the month during the research period. This procedure might decrease the number of suicide attempt cases related to

| Table 1. Descriptive characteristics of adolescents and comparison between the groups |
|-----------------------------------|-----------------|-----------------|-----------------|-----------------|
|                                   | Suicidal Attempt Group | Comparing Group | Total |
| (n=100)                           | (n=100)           | (N=200)         | P     |
| Age  (15-16)                      | 15 (14-16) n (%)  | 15 (14-16) n (%)| 15 (14-16) n (%)| 0.941 ^   |
| Gender                           |                   |                 |       |
| Female                           | 74 (56.1) a       | 58 (43.9)       | 132 (100.0) | 0.017 a |
| Male                             | 26 (38.2)         | 42 (61.8)       | 68 (100.0)  |       |
| Marital Status                   |                   |                 |       |
| Married                          | 1 (100.0)         | 0 (0.0)         | 1 (100.0)    | vaud   |
| Single                           | 99 (49.7)         | 100 (50.3)      | 199 (100.0) |       |
| Educational Status              |                   |                 |       |
| Going to school                  | 83 (45.4)         | 100 (54.6)      | 183 (100.0)  | <0.001 a |
| Not going to school              | 17 (100.0) a      | 0 (0.0)         | 17 (100.0)   |       |
| School Success                   |                   |                 |       |
| Good                             | 36 (34.3)         | 69 (65.7)       | 105 (100.0)  | <0.001 a |
| Average                          | 29 (51.8)         | 27 (48.2)       | 56 (100.0)   |       |
| Bad                              | 18 (81.8) a       | 4 (18.2)        | 22 (100.0)   |       |
| Employment Status               |                   |                 |       |
| Employed                         | 7 (53.8)          | 6 (46.2)        | 13 (100.0)   | 0.999 a |
| Unemployed                       | 93 (49.7)         | 94 (50.5)       | 187 (100.0)  |       |
| Having a Chronic Disease         |                   |                 |       |
| Yes                              | 5 (26.3)          | 14 (73.7)       | 19 (100.0)   | 0.051 a |
| No                               | 95 (52.5)         | 86 (47.5)       | 181 (100.0)  |       |
| Having a Psychological Disorder  |                   |                 |       |
| Yes                              | 12 (85.7) a       | 2 (14.3)        | 14 (100.0)   | 0.010 a |
| No                               | 88 (47.3)         | 98 (52.7)       | 186 (100.0)  |       |
| Time Apart from Parents          |                   |                 |       |
| Yes                              | 10 (41.7)         | 14 (58.3)       | 24 (100.0)   | 0.515 a |
| No                               | 90 (51.1)         | 86 (48.9)       | 176 (100.0)  |       |
| Family Immigration               |                   |                 |       |
| Yes                              | 1 (14.3)          | 6 (85.7)        | 7 (100.0)    | 0.118 a |
| No                               | 99 (51.3)         | 94 (48.7)       | 193 (100.0)  |       |

1Mann Whitney U test, 2Pearson Chi-Square Test, 3Exact, 4Monte Carlo, 5Fisher Exact Test (Exact), 6Fisher Freeman Halton Test (Monte Carlo), (A, B, C), expresses the significance of the related groups according to Benjamini-Hochberg Correction, Q1: 1. Persentil (%25), Q3: 1. Persentil (%75), vaud
Suicide attempt

Table 2. Descriptive Characteristics of Families of Adolescents and Comparison between the groups

<table>
<thead>
<tr>
<th>Family Type</th>
<th>Suicidal Attempt</th>
<th>Comparing Group</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n=100)</td>
<td>(n=200)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
</tbody>
</table>

- Nuclear
  - A 87 (51.2) 83 (48.8) 170 (100.0) 0.553
- Extended
  - B 13 (43.3) 17 (56.7) 30 (100.0)
- Parental Relationship Status
  - Parents living together
    - A 79 (45.1) 96 (54.9) 175 (100.0) <0.001
    - B 21 (84.0) 4 (16.0) 25 (100.0)
- Family Income Status
  - Income lower than expenditures
    - A 17 (53.1) 15 (46.9) 32 (100.0) 0.187
  - Income equal to expenditures
    - B 75 (52.4) 68 (47.6) 143 (100.0)
  - Income higher than expenditures
    - C 8 (32.0) 17 (68.0) 25 (100.0)
- Total Number of Children of Families
  - Single child
    - A 8 (61.5) 5 (38.5) 13 (100.0) 0.528
  - 2 children
    - B 47 (48.5) 50 (51.5) 97 (100.0)
  - 3 children
    - C 37 (51.4) 35 (48.6) 72 (100.0)
  - 4 children
    - D 6 (40.0) 9 (60.0) 15 (100.0)
  - 5 children and more
    - E 2 (66.7) 1 (33.3) 3 (100.0)
- Birth-Order of the Child
  - First
    - A 47 (56.6) 36 (43.4) 83 (100.0) 0.211
  - Second
    - B 40 (47.6) 44 (52.4) 84 (100.0)
  - Third and High
    - C 13 (39.4) 20 (60.6) 33 (100.0)

1Fisher Freeman Halton Test (Monte Carlo), (A, B, C, D, E); expresses the significance of the related groups according to Benjamini-Hochberg Correction.

It was detected that having a good relationship with friends (p<0.001), mother (p<0.005), and father (p<0.001) decreased the risk of the suicide attempt while there was no difference between the groups regarding the relationship with siblings and suicide attempt (p=0.060) (Table 1). In adolescents with a moderate and bad relationship with friend(s) and father, suicide attempt was found to be higher than adolescents with a good relationship with friend(s) and father. In adolescents with a moderate relationship with their mothers, suicide attempts were found to be higher than adolescents with a good relationship with their mothers.

Other studies in the literature reveal that having a good relationship with friends [9, 12, 19], mother, father [19] and sibling(s) [20] decreases the risk of suicide attempts in adolescents. The results of our study are similar to other studies in the literature with the exception of those related to sibling relationships.

There is a significant difference between the groups in terms of parental relationship status and suicide attempts of adolescents. Those having divorced parents have a higher risk of suicide attempt (p<0.001) (Table 2). The results of other studies [7, 20] are similar to those in our study, as well. It is stated in a study of Gould and Kramer [15] that separation, divorcement and the parental loss increase the risk of suicide attempt in adolescents. Loneliness in this situation, longing for the parents caused by parental separation, financial difficulties, the lack of support and care in parents may increase the risk of suicide attempt by creating the traumatic effect in adolescents.

Another important finding of our study is that adolescents having a working mother has higher risk of suicide attempt (p<0.001). This finding is similar to that of Duman and Inci [7]. In our literature review, we could not reach another study on this subject. It also reveals that adolescents who want to be independent need a continuous mother’s care and supervision. There is a significant difference between the two groups regarding the mother’s attitude and suicide attempt of adolescents (p=0.023) (Table 3). Suicide attempt rate was found to be high in adolescents whose mothers exhibited repudiative attitude. On the other hand, there is no difference between the groups regarding the father’s attitude and suicide attempt (p=0.148) (Table 3). According to the study by Zaborskis et al. [21], a non-intact family structure and weak family functioning are significant predictors of suicidal ideation and attempts among adolescents. It is essential to consider family life practices in planning intervention programs for the prevention of suicides among adolescents. Adolescents facing the lack of substance use. The difference in this study from the other studies concerning the results may be linked to this practice.
care and love in the family and having a continuous conflict with the parents feel unloved, weak, insecure, and have difficulty in fitting into society.

There is a difference between the two groups regarding those who get decisions in the family and suicide attempt of the adolescents. Suicide attempt rate is lower in the families where the shared decision-making is employed by the whole family including children (p<0.004) (Table 3). It was determined that the rate of attempted suicide was higher in the families decided by the father and/or the parents (grandparents) than in the families decided by the parents and/or parents and children.

There is no research result concerning this study in the literature. This difference may be explained that adolescents who participate in the decisions making by the families feel valuable.

There is a significant difference between the groups regarding whether the child’s opinion is asked for the family decisions and its relationship with the suicide attempt. The group whose opinion is not asked for has higher rates of suicide attempt (p<0.001) (Table 3). There is no research result in the literature concerning this. This result may be linked to a feeling of being ignored and feeling worthless of an adolescent when the child’s opinion is not asked for, especially during a period in which personality development, as well as physical development, occurs. That's why the risk of suicide attempt may increase in adolescents.

When asked for the reasons of attempting to commit suicide, school failure was remarked as the main reason by 18%, quarreling with the father by 15%, interparental conflict by 10%, and the family pressure by 9%. The most common reason for the adolescent suicides in the study is familial factors. The results of other studies [4, 5, 7, 9, 12] which are similar to those of our research detect the familial problems as the main reason for adolescent suicide. It also reveals that the adolescence period may affect the individual’s whole life. An adolescent determines his/her place in the society with the help of his/her gender and personality development, and relationship with the opposite sex. Therefore, the potential problems with the opposite sex, family, and friends may drive adolescents into suicide, and suicide attempt may seem as a solution to solve their problems.

When asked for current thoughts, 66% of the adolescents in the suicidal attempt group (n=100) showed their regrets for attempting suicide while 21% indicated that they could attempt to do it once again and 13% stated that they are neutral. In other words, more than half of the adolescents in the study regret what they did. It was stated in the study conducted by Gulec and Aksaray that half of the cases were in the search for help after attempting suicide [8]. According to the results of this study, it appeared that the suicide attempt was not carried out to end their lives. It was also detected in this research that the adolescent who attempted suicide regret for their action. However, it is very important to prevent repetition that may result in death by applying appropriate treatment and approach to the group which states that they may attempt suicide again and group that is hesitant.

Conclusion

As a result of the study, it has been identified that females, dropouts, the ones failing at school, bad school success, having psychological disorders, who are smokers, the ones having alcohol use, having bad relationship with his/her friends, having bad relationship with his/her mother, and having bad relationship with his/her father have more tendency towards suicide attempt.

Although suicide attempts are mainly carried out for the purpose of intentionally killing oneself, they may also be carried out to attract attention, to express desperation and hopelessness. Whatever the reason might be, every attempt should be taken seriously into consideration. Nurses, an important member of the health team, should play an active role not only for the patients in the hospital but also in the early diagnosis and treatment of suicidal behavior by evaluating risky groups in society.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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