

Suicidal Deaths Among Children and Adolescents in Ankara Between 2001 and 2006

Ankara'da 2001-2006 Yıllarında İntihara Bağlı Çocuk ve Adolesan Ölümleri

Gürol CANTÜRK, MD,^a
Nergis CANTÜRK, MD,^b
Hacer YAŞAR TEKE, MD,^a
Zerrin ERKOL, MD,^c
Mehmet Sunay YAVUZ, MD^d

^aForensic Medicine Department,
Ankara University Faculty of Medicine,

^bSpecialist of Forensic Medicine,
Institute of Forensic Medicine, Ankara

^cForensic Medicine Department,
Bolu İzzet Baysal University
Faculty of Medicine, Bolu

^dForensic Medicine Department,
Celal Bayar University
Faculty of Medicine, Manisa

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Yazışma Adresi/Correspondence:

Gürol CANTÜRK, MD
Ankara University Faculty of Medicine,
Forensic Medicine Department,
Ankara,
TÜRKİYE/TURKEY
gurolcanturk@yahoo.com

ABSTRACT Objective: Suicides among children and adolescents occur very seldom and only a few case reports and even fewer comprehensive studies are available in the forensic literature. We attempted to investigate socio-demographic characteristics like suicide age, sex, suicide method and cause of suicidal deaths among children and adolescents in Ankara, and to determine the causes of suicides which were preventable. **Material and Methods:** We retrospectively analyzed the autopsy records of the Institute of Forensic Medicine, Ankara, where all autopsies requested from the health centres in Ankara and surrounding 17 cities were performed, and the database of the judicial records from 2001 to 2006. The suicide cases were divided into three age groups: 7-10 years, 11-15 years and 16-18 years. **Results:** There were 114 suicides involving 60 females (52.6%) and 54 males (47.3%) aged between seven and 18 years with a median age of 16.0 years (SD= 2.21). The most frequently used suicide method was hanging, followed by firearm injuries with handguns, firearm injuries with rifles, drug intoxication and jumping from a high place. Eighty one point two per cent of intoxication cases aged between 16 and 18 years. However, there was no significant difference in the toxic substance use between the genders. Of all suicide cases, 28 (24.6%) had ethanol in blood. **Conclusion:** In this study, the number of female suicides was higher than that of male suicides and there were differences in suicide methods, causes of suicides and suicide age, consistent with the results of several other studies from Turkey. Children and adolescents should be prevented from accessing firearms and toxic substances, which will play an important role in prevention of suicides.

Key Words: Child; adolescent; autopsy; death; suicide

ÖZET Amaç: Çocuk ve adolesan intiharları çok nadir görülmektedir ve adli literatürde sadece bazı olgu sunumları ile az sayıda kapsamlı çalışma vardır. Bu çalışmanın amacı Ankara'da intihar eden çocuk ve adolesanlar arasındaki yaş, cinsiyet, intihar nedeni ve yöntemi gibi sosyo-demografik özellikleri belirlemek ve alınabilecek önlemleri tanımlamaktır. **Gereç ve Yöntemler:** Adli Tıp Kurumu Ankara Grup Başkanlığında çevresindeki 17 ilden gönderilen olgular ile birlikte 2001-2006 yılları arasında yapılan otopsi olgularının raporları ve adli tahkikat dosyaları retrospektif olarak incelenmiştir. İntihar olguları 7-10 yaş, 11-15 yaş ve 16-18 yaş olmak üzere üç yaş grubuna bölünerek incelenmiştir. **Bulgular:** Toplam 114 intihar olgusunun 60'ı kız (%52.6), 54'ü (%47.3) erkek, yaşları 7-18 arasında ve yaş ortalaması 16.0'dır. En sık kullanılan intihar yöntemi ası olup, bunu sırasıyla tabanca ve av tüfeği yaralanması, zehirlenmeler ve yüksekte atlama yöntemleri izlemekteydi. Zehirlenme olgularının %81.2'si 16-18 yaş aralığındaydı. Bununla birlikte erkek ve kız olgular arasında toksik madde kullanımı açısından anlamlı bir fark bulunmamıştır. Yüz on dört intihar olgusunun 28'inde (%24.6) kanda etil alkol tespit edilmiştir. **Sonuç:** Bu çalışmada intihar eden kız çocukların sayısı erkeklerden fazlaydı. Türkiye'de yapılan çeşitli çalışmalarda da intihar eden kız çocuklarının sayısının erkeklerden fazla olduğu ve seçilen intihar yöntemi, intihar nedeni ve intihar yaşı açısından yapılan diğer çalışmalarla uyumlu olarak her iki cinsiyet arasında farklılıklar bulunduğu belirlenmiştir. İntiharlarda sıklıkla seçilen yöntemlerden ateşli silahlara ve toksik maddelere ulaşılabilirliğin engellenmesi intiharların önlenmesinde önemli rol oynayacaktır.

Anahtar Kelimeler: Çocuk; adolesan; otopsi; ölüm; intihar

It is generally agreed that children rarely commit suicide, however the number of suicides slowly increases throughout adolescence and young adulthood.^{1,2} In fact, there have been studies showing that the number of suicides increases in these age groups.^{2,3} The forensic literature on this phenomenon comprises a few more comprehensive studies²⁻⁵ and case reports.⁶⁻⁸ As children grow into adolescence, many experience a tumultuous period of maturation, characterized by efforts to gain independence and transition into adult society. This period of exploration and transformation is often associated with varying levels of anxiety and stress, which may lead to maladaptive feelings of hopelessness, personal failure and suicidal ideation.⁹

There have been several autopsy studies on the rates of suicide as a cause of death among children in Turkey with conflicting results. Salacin et al.¹⁰ reported that 30.2% of the deaths among children were due to suicide in Adana and the surrounding cities between 1983 and 1990. Arslan et al.¹¹ showed that the manner of death was suicide in 28.7% of the deaths among children between 1997 and 2001. According to data on suicides in 2003 from the Turkish Statistical Institute, the highest rate of suicide occurred between the ages of 15-29 years among both males and females, at the age of 15-19 years among females and at the age of 20-24 years among males. The most frequently used method was hanging (38.7%) in children and the cause of death was intoxication in 84.7% of all suicides.¹²

The aim of this study was to investigate general characteristics of suicidal deaths among children and adolescents and to determine the causes of suicides which were preventable.

MATERIAL AND METHODS

We retrospectively evaluated judicial reports, death certificates and autopsy results of suicides among children aged between seven and 18 years, suspected of having committed suicide by the district attorney and found to have committed suicide by Morgue Department of the Institute of Forensic Medicine, Ankara, between 2001 and

2006. A total of 114 children and adolescent suicides between 2001 and 2006 were retrospectively reviewed. Data on age, gender, suicide method, suicide scene, results of toxicological analyses, results of vaginal and anal swabs, months or seasons when suicides occurred, presence of suicidal note, locations of bullet entries in suicides with firearms, history of previous suicide attempts, previous diseases and history of diseases and diseases determined at autopsy were collected. Based on psychosocial developmental stages of childhood and the legal procedure for suicides followed in Turkey, the suicide cases were divided into three age groups: 7-10 years, 11-15 years and 16-18 years.

Since the ages of 6-10 were considered as school age and the ages of 11-18 as puberty and the youngest suicide was aged seven years, we assigned the suicides into the following age groups: 7-10 years, 11-15 years (early puberty) and 16-18 years (late puberty).

Data were analyzed with Chi-square test and SPSS 11.0.

RESULTS

Out of 114 suicide cases, 60 (52.6%) were females and 54 (47.4%) were males. The suicide cases were aged between seven and 18 years with a median age of 16.0 years (SD= 2.21). There were two suicide cases aged below 10 years and two suicide cases aged 10 years. There was no significant difference in age groups between males and females ($p > 0.05$) (Table 1).

Table 2 shows the distribution of suicides assigned into age groups by years. Although 44.4% of the suicidal deaths, a relatively high percentage of the suicides, occurred among the children aged 16-18 years in 2002, there was no significant difference between the children in the three age groups ($p > 0.05$).

The most frequently used suicide method was hanging, followed by firearm injuries with handguns, firearm injuries with rifles, drug intoxication and jumping from a high place (Table 3). There was a decrease in the number of firearm injuries through the years. Eighty one point two

TABLE 1: Distribution of age groups by gender.

Age groups	Male		Female		Total	
	N	%	N	%	N	%
7-10	2	1.75	2	1.75	4	3.51
11-15	11	9.65	16	14.04	27	23.68
16-18	41	35.97	42	36.84	83	72.81
Total	54	47.37	60	52.63	114	100.00

TABLE 2: Distribution of age groups by years.

Ages/Years	2001	2002	2003	2004	2005	2006	Total
7-10	-	2	1	1	-	-	4
11-15	5	4	5	5	4	4	27
16-18	9	16	16	12	12	18	83
Total	14	22	22	18	16	22	114

TABLE 3: Suicide methods.

Suicide Methods	Male		Female		Total	
	N	%	N	%	N	%
Hanging	22	19.30	24	21.05	46	40.35
Firearm (Handgun)	16	14.03	12	10.53	28	24.57
Firearm (Rifle)	10	8.77	7	6.14	17	14.91
Intoxication	9	7.89	7	6.14	16	14.03
Falling from high	3	2.63	3	2.63	6	5.26
Drowning	-	-	1	0.88	1	0.88
Total	60	52.63	54	47.37	114	100.00

per cent of intoxications were aged between 16 and 18 years. However, there was no significant difference in the toxic substance used between genders ($p > 0.05$). Out of 16 suicides of intoxication, two took drugs used for the treatment of heart diseases, four antidepressant drugs, one colchicines, seven insecticide, one insecticide plus antidepressant drugs and one bronchodilators. Table 4 shows the distribution of the suicide methods by age groups.

Of all suicide cases, 28 (24.6%) had ethanol in blood. Out of these 28 suicide cases, 20 had low levels of ethanol (1-100 mg/dl), five had moderate levels of ethanol (101-199 mg/dl) and three had high levels of ethanol (200 mg/dl and over).

The hymen was perforated in seven female cases (11.7%), vaginal swabs revealed sperm only in one female suicide case and anal swabs showed sperm only in one male suicide case. One suicide case was pregnant and DNA analysis showed that her father was the father of the baby.

Locations of bullet entries in 45 suicide cases with firearm injury are shown in Table 5.

The most frequent suicide scene was home ($n = 90$, 78.9%) and much less frequent suicide scenes were a hut ($n = 24$, 21.0%), workplace, prison, land for agriculture, construction site and barn. Of all suicide cases, 86.8% ($n = 99$) died at the scene and 13.2% ($n = 15$) died in hospital.

TABLE 4: Distribution of suicide methods by age groups.

Suicide Method	7-10 Years		11-15 Years		16-18 Years	
	N	%	N	%	N	%
Hanging	4	100	13	48.15	29	34.94
Firearms	-	-	11	40.74	34	40.96
Intoxication	-	-	3	11.11	13	15.66
Jumping from high	-	-	-	-	6	7.23
Drowning	-	-	-	-	1	1.21
Total	4	100	27	100	83	100

TABLE 5: Sites of firearm wounds.

Wounds Sites	Rifle		Handgun		Total	
	N	%	N	%	N	%
Head	5	11.11	20	44.45	25	55.56
Chest	8	17.77	3	6.66	11	24.44
Abdomen	3	6.66	4	8.89	7	15.56
Neck	2	4.44	-	-	2	4.44
Total	18	40.00	27	60.00	45	100.00

Fifteen point seventy eight per cent of the suicide cases (n= 18) left a suicide note and there was no significant difference between the age groups ($p > 0.05$) and the genders ($p > 0.05$).

There was no significant difference in the distribution of suicide cases by seasons between genders ($p > 0.05$) (Table 6).

Figure 1 shows the distribution of the suicide cases by months.

All three suicide cases with previous suicide attempts were males and only one case had more than one suicidal attempts. Seven cases were diagnosed with depression, one case on treatment for thalassemia committed suicide with colchicines, one case had continuous headaches, one case had a psychotic disorder. One case had an incestuous relationship, five suicide cases were prevented by

their parents from meeting their boyfriends, one case was a child worker, one case had lost his father, one suicide case was exposed to familial violence due to marital conflict and one case who hanged himself had watched the scenes of hanging on TV on the day he committed suicide. Sixteen suicide cases' (14.0%) parents were the divorced or the separated.

DISCUSSION

Suicide is an important public health problem over the world. Lately, suicide rates among male adolescents have either increased or remained unchanged in many countries.^{2,3}

A study from Hungary revealed that there were 72 (59 males and 13 females) suicides aged 0-18 years with a median age of 16.9 years (SD= 2.1) in

TABLE 6: Distribution of suicides by seasons.

Sex/Season	Winter	Spring	Summer	Autumn	Total
Female	16	13	14	17	60
Male	15	11	15	13	54
Total	31	24	29	30	114

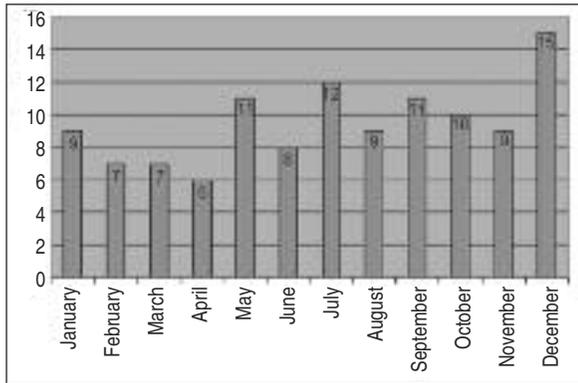


FIGURE 1: Distribution of suicides by months.

five years.¹³ In the present study, the median age of the suicide cases was 16.0 years (SD= 2.21). The forensic medicine literature has shown a preponderance of male adolescent suicides.³⁻⁵ However, we found a higher number of suicides in females (52.6%). Several other studies from Turkey also revealed that there were a higher number of female suicide cases.¹⁴⁻¹⁶ In addition, the TUIK (Turkish Statistical Institute) reported in 2003 that 59.1% of 540 child suicides were females. The crude suicide rate in Turkey was 3.88 per 100.000 in 2006. The rate of female suicide cases aged less than 15 years and the rate of female suicide cases aged 15-24 years were higher than the rate of male suicide cases between 1997 and 2006.¹²

Suicide rates vary with countries and age groups. In Hungary the suicide rate has decreased in the past ten years (45.3 to 30 per 100,000).¹³ In Belgium the suicide rate increased among males aged 15-24 years (11.8 per 100,000 in 1990; 25.4 per 100,000 in 2000).¹⁷ The rate of suicides in the USA was 1.5 per 100,000 among 10-14 year-old children and 8.2 per 100,00 among 15-19 year-old children in 2000.¹⁸ The rate of suicides among the age groups of 10-14 years and 15-19 years was 0.3 (males), 0.1 (females) and 4.2 (males), 0.8 (females) per 100.000 in England and Wales, 1.2 (males), 0.6 (females) and 31.7 (males), 5.0 (females) per 100,000 in Finland, 1.2 (males), 0.8 (females) and 8.0 (males), 2.6 (females) per 100.000 in Germany, 3.4 (males), 0.0 (females) and 12.8 (males), 2.6 (females) per 100.000 in Ireland and 3.7 (males), 1.6 (females)

and 17.3 (males), 4.3 (females) per 100.000 in Norway, respectively.¹⁹

In our institute, undiagnosed autopsies are referred to Turkish First Specialization Board of Institute of Forensic Medicine. In a study by Yayıci et al. in First Specialization Board of Institute of Forensic Medicine, 81.58% of child suicide cases were girls.²⁰ The preponderance of female suicide cases can be attributed to the pressure put on girls by families in conservative communities in Turkey in the name of female virtue and virginity.

In recent years, there has been a significant increase in suicides among young men in many countries although suicide rates among children and adolescents remained unchanged or showed an increase in most societies.^{13,21,22} The frequency of suicides may vary with genders.

In a study on childhood deaths, Arslan et al. showed that suicide was common among the age group of 16-18 years.¹¹ Likewise, we found that the highest rate of suicides (72.8%) was at ages between 16 and 18 years and that 31 suicide cases (27.2%) were 15 years old or younger.

The fatal and violent forms of suicide are preferred by boys.^{13,23,24} Self-poisoning is more common method of suicide among females than males according to the literature.^{2,13,19,21,25-27} TUIK revealed that female suicide cases (0-19 years) accounted for 81.4% all suicides (96/118) of taking chemicals in Turkey in 2006.¹² Similarly, in the present study, the number of female suicide cases taking poison was high (female/male ratio= 9/7).

Hanging is one of the most common methods of suicide in the young, and this method is reported to have been increasingly used. Several studies have revealed that the frequently preferred method for suicide among the young and adolescents is jumping from a high place.^{2,13,19,21,25,26} However, in this study hanging was the most frequent method of suicide (45.41%). TUIK revealed that the most frequent method of suicide was hanging (40.55% of the suicides aged 0-19 years in 2006).¹² Oner et

al. from Turkey in their study including all age groups reported that hanging and firearms were the most frequent suicide methods between 1990 and 2000.²⁷ However, several studies have shown that firearm suicide rates continue to rise and that the greatest proportion of suicides among males was committed by gunshots.^{13,28} In the USA, suicide is more common among males and firearm injury is the most common method of suicide in the age group of 11-24 years.^{3,29} Firearm injury in Scandinavia is most frequently used method by young males.¹⁹ In the present study, the most frequent method of suicide was hanging among adolescents aged 0-15 years, and firearm injuries followed by hanging among people aged over 15 years, consistent with the study from Norway.¹²

There are big differences in the number of accomplished suicides and suicide attempts committed. Girls have been reported to have double suicide attempts. The fatal and violent methods of suicide are chosen by males.^{13,30} Previous acts are underestimated because of insufficient information. A non-fatal suicidal act is the most important predictor of possible future suicides and it means that this significant marker of risk must not be neglected. In the present study, three suicide cases had previous suicide attempts and one suicide case had more than one suicide attempt. Methods used in accomplished suicides vary with countries.^{13,19} Evaluation of epidemiological and post-mortem findings from children and adolescent suicides could be helpful in planning suicide prevention. An international comparison of data from young suicides may help to determine similarities in suicidal trends among young people. Differences in suicide methods between countries, genders and age groups suggest that some methods of suicide are more easily available in some age groups and genders and in some societies than the others. For example, firearms are easily available in the USA and Scandinavian countries and the most frequent method of suicide is firearm injuries in those countries.

It has been reported that most of the child and adolescent suicides occur at home or in ne-

arby places the suicides were familiar with. Suicides less frequently occur in hospital, motel, prison, open field, hut, public locations and school.^{2,3,13,29} In the present study, the most frequent suicide scene was home (78.9%), consistent with the literature.

The rate of suicidal notes or letters has been reported to vary between 8.3% and 33.1%.^{2,3,13,29} In this study, of all the suicide cases, 15.8% (n= 18) left a suicide note, comparable with the literature. It was proposed that psychiatric disorders were risk factors increasing suicides among young people. There is evidence from psychological autopsy studies that psychiatric disorders such as schizophrenia, affective disorder, gender identity disorder, substance-related disorder, personality disorder and major depression represent a strong risk for suicide in the young.^{17-19,21,31} In the present study, 6.1% of the suicide cases were found to receive psychiatric treatment.

With regard to the role of family members in suicide of young people, a high proportion of parental psychopathology, a high frequency of suicides of family members and broken home situations were identified.^{2,17,18,21,32} We also found that 14.0% of the suicide cases' (n= 16) parents were the divorced or the separated.

It was claimed in one study that most of the child and adolescent suicides were committed in spring and fall.³³ Several other studies have revealed that suicides of children and adolescents increase at the beginning of academic years, during exam periods and spring and fall.^{2,13} However, we did not find seasonal or monthly variations in the rate of suicide. Likewise, Yayci et al²⁰ did not report seasonal variations in childhood suicides.

Children and adolescents are murdered or commit suicide for honor. Every year more than 5000 women are killed for honor in the world. Most of these honor murders are claimed to be committed in such countries as Brazil, Egypt, Israel, Italy, Pakistan, Sweden, England, India, Morocco and Turkey.³⁴ Violence against women, oppression due to honor and other kinds of oppression force wo-

men to commit suicide as if it were the only solution to problems.³⁵ It is also claimed that 16% of the female population were sexually abused by a family member before the age of 18 years.³⁶

Forensic medicine specialists who perform autopsies should keep in mind that suicides among children and adolescents may be due to physical and sexual violence. Findings that could be obtained at a thorough physical and genital examination may reveal the cause of suicides.

Suicide is a complex issue. In fact, many factors may play a role in suicide. It can be encountered among people with or without psychiatric disorders and people with or without stressful life events. Considering that hanging, firearms and toxic substances were the most frequent suicidal methods, firearms and toxic substances should not

be available to individuals at risk of suicides, individuals with mental problems should be provided with psychiatric counseling and appropriate education should be offered to groups of people at high risk of suicides. The role of forensic medicine in societies is not only limited to the investigation of criminal cases; forensic scientists must also conceive appropriate measures for preventable deaths.³⁷

We think that every society has special features regarding with religion, social status, economic status and educational level. Therefore, social and cultural traditions should be taken account of in the prevention programs for suicidal behaviour.

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