

# Epidemiology of attempted suicide in Hatay, Turkey

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## ABSTRACT

**الأهداف:** التحقق من معدل الانتحار في تركيا، وتحديد العوامل الاجتماعية الديموغرافية التي تزيد من خطر الانتحار، بالإضافة إلى معرفة الأسباب التي تؤدي إلى محاولة الانتحار.

**الطريقة:** تكونت هذه الدراسة الاسترجاعية من 1613 حالة انتحار سُجّلت في قسم الطوارئ التابع لثمان مستشفيات في هاتاي، تركيا، وقد استمرت خلال الفترة من يناير 2007م إلى ديسمبر 2009م. لقد قمنا باسترجاع سجلات المرضى من أجل تحليل بيانات المرضى الخاصة بكل من: العمر، والجنس، ومستوى التعليم، والحالة الاجتماعية، والمهنة، وظهور الأمراض النفسية سابقاً في المريض أو العائلة، وسبب الانتحار، ووسيلة الانتحار، ومحاولات الانتحار السابقة التي قام بها المريض أو عائلته. فيما جُمعت المعلومات المتعلقة بعدد السكان من معهد الإحصاء العملي، وأستخدم اختبار مربع كاي والتوزيع النسبي من أجل التحليل الإحصائي.

**النتائج:** لقد كان متوسط عمر الإناث (23.9±9.7) أقل من متوسط عمر الذكور (26.9±9.7)، وأشارت نتائج الدراسة إلى أن متوسط محاولات الانتحار السنوي لكل 100,000 قد كان 38.14 (بين الذكور، و60.42 بين الإناث). ولقد نقص معدل الانتحار بزيادة العمر، وظهرت المعدلات العالية من الانتحار في الفئة العمرية 15-24 عاماً، والإناث، والمرضى الغير متزوجين، والأفراد ذوي الخلفية العملية العالية. وقد كان التسمم وزيادة جرعة الأدوية من أكثر الوسائل المستخدمة للانتحار، فيما كان العنف الأسري من أكثر الأسباب المؤدية لهذه المشكلة. وقد زاد ظهور المرض النفسي في العائلة أو المريض وكذلك محاولات الانتحار السابقة في العائلة من خطر تكرار حالات الانتحار.

**خاتمة:** أظهرت الدراسة بأن معدلات محاولات الانتحار قد كان أقل من البلدان الغربية ومثابه لتلك التي توصلت إليها الدراسات في تركيا، كما يعد خطر تكرار محاولات الانتحار عالياً ومرتبطة بالعوامل النفسية.

**Objective:** To determine suicide rates, socio-demographic risk factors, and reasons for suicide attempts.

**Methods:** This hospital based, retrospective study consisted of 1613 suicide attempts brought to the

emergency services of 8 state hospitals in Hatay, Turkey from January 2007 to December 2009. We obtained the data by retrospective analysis of patient record forms including information on age, gender, education level, marital status, occupation, reason for suicide, method of suicide, presence of previous psychiatric disease in the patient or family, previous suicidal behavior in the patient or family. We obtained current population data of the province from the Turkish State Institute of Statistics. Chi-Square test, and percentage distribution was used for the statistical analysis.

**Results:** The mean age of females (23.9±7.9) was lower than males (26.6±9.7). The mean annual rate of attempted suicides per 100,000 was 38.14 (16.11 in males, 60.42 in females). The rate decreased as the age increased, and was highest in the 15-24 age group, in women, in non-married patients, and in the individuals with high school education. Self-poisoning with a drug overdose was the most common method, and domestic conflicts were the most common reason. Psychiatric disease history in the family or patient, and suicide attempt in the family were risk factors associated with repeated suicide attempts.

**Conclusion:** The suicide attempt rate was lower than in many western countries, and similar to previous studies in Turkey. The risk of recurrence in suicide attempts is high, and is associated with psychosocial factors.

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When suicide related concepts are looked at, suicidal thoughts, suicide attempts, and completed suicides are considered. The World Health Organization (WHO) defines a suicide attempt as an act with a nonfatal outcome, in which an individual deliberately initiates a non-habitual behavior that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally realized therapeutic dosage, and which is aimed at realizing changes that the subject desired via the actual or expected physical consequences.<sup>1</sup> Suicidal behavior is increasing as a public health problem in the world today. According to the WHO, suicide is among the top 10 causes of death. Of all deaths, 0.9% are a result of suicide.<sup>2</sup> Suicide as a global disease was 1.8% in 1998, while in 2020 the ratio is expected to rise to 2.4%.<sup>3</sup> The WHO estimates that approximately one million people die each year because of suicide. Suicide rates have increased by 60% in the last 45 years, and the WHO reports that these figures do not include suicide attempts, which are approximately 20 times more common. It is estimated that 10-20 million people attempt suicide in the world.<sup>3</sup> One review<sup>4</sup> reported the suicide attempt annual incidences between 2.6-1100 per 100000, and lifetime prevalences between 720-5930 per 100000 from different countries. In the WHO/EURO multi-centre study,<sup>5</sup> which aimed to evaluate suicide attempt in European countries, the rates per 100000 were reported between 20-390 in males, and 62-544 in females. The State Institute of Statistics (SIS) gathered and published information on suicide statistics in 1962.<sup>2</sup> However, these statistics did not include data on suicide attempts in Turkey. In general, there are local studies on suicide attempts, therefore, the epidemiology of suicide attempt is not well known in Turkey. The WHO/EURO Multicentre Study<sup>7</sup> determined 737 suicide attempts from 1998 to 2002 in Turkey. From this data, they calculated a suicide attempt rate of 78.9 per 100000 in a population aged 15 and over, with a rate of 56.9 in males, and 112.9 in females. Although these rates are lower than in European countries, a significant increase was observed during the 4 years. Suicide attempts are often associated with experience of depression, substance abuse, various mental disorders, family violence, and unpleasant life events. In addition to gender; age, marital status, occupation, education level, economic problems, unemployment, and migration are socio-economic factors affecting suicide attempts.<sup>2,8</sup> Early detection and control of the risk factors are essential steps in preventing suicide attempts.<sup>8</sup> This study aims to determine the socio-demographic characteristics of the cases, the risk factors for suicide attempts, and the suicide methods in the province of Hatay, Turkey.

**Methods.** This hospital based, retrospective study consisted of 1613 suicide attempt cases presenting to the emergency services of 8 state hospitals (Antakya, Iskenderun, Samandag, Kirikhan, Hassa, Reyhanli, Dortyol, Altinozu) in the southeastern province of Hatay, Turkey from January 2007 to December 2009. We obtained the data by retrospective analysis of patient record forms including information such as age, gender, education level, marital status, occupation, reason for suicide, method of suicide, presence of previous psychiatric disease in the patient or family, and previous suicidal behavior in the family or patient. We obtained current population data of the province from the State Institute of Statistics (SIS).<sup>9</sup>

We used Epi Info™ Version 3.5.1 (CDC, Atlanta, GA, USA) to analyze the data. Chi-Square test, and percentage distribution were used for the statistical analysis. The means were displayed with standard deviations. We considered the differences to be significant at the level of  $p < 0.05$ . The hypotheses were established as two-sided. The Medical Ethics Committee of Mustafa Kemal University Faculty of Medicine reviewed and approved the study.

**Results.** The mean age of the suicide attempt cases over the 3 years was  $24.3 \pm 7.3$  years, the minimum age was 10, and the maximum age was 63. The mean age of females ( $23.9 \pm 7.9$ ) was lower than males ( $26.6 \pm 9.7$ ), ( $p < 0.001$ ). Of the cases, 62.2% were in the 15-24 years age group, 78.7% were females, and 52.1% graduated from primary school. The percentage of unmarried patients was 51.3%, and the female/male ratio was 3.75. In terms of distribution of suicide attempts by year, a total of 689 suicide attempts (140 males and 549 females) were observed in 2007, with an annual rate of suicide attempt per 100000 of 49.7; 79.5 in females and 20.1 in males. The female/male suicide attempt ratio was 3.95. The total number of suicide attempts in 2008 was 559 (116 males and 443 females), with an annual rate of suicide attempt per 100000 of 39.55; 62.86 in females, and 16.37 in males. The female/male suicide attempt ratio was 3.83. The total number of suicide attempts in 2009 was 365 (87 males and 278 females). Annual attempt rate per 100,000 was 25.19; 38.86 in females and 11.86 in males. The female/male suicide attempt ratio was 3.27 (chi-square 113.441,  $p < 0.000$ ). When the distribution of suicide attempts by age, gender, and marital status were evaluated, the highest rate was in the 15-24 years of age group, and suicide attempts were nearly 5 times higher in the females than in the males (Table 1). Suicide attempts were higher in the unmarried patients compared with married patients of both genders, and being single increased the suicide attempt risk approximately 4-fold in the males, and 3-fold in the females. The suicide attempt prevalence was also higher

in individuals with a high school and over education level (Table 1). When the distribution of suicide attempts by gender and suicide reasons was investigated, domestic conflicts, problems with the opposite gender, domestic violence, and psychiatric disease were the leading suicide attempt reasons in our study. Domestic conflict was the most frequent factor leading to suicide attempt in both genders, and while domestic conflicts were lower in the males, economic problems were higher in the males than the females (Table 2). Regarding methods of suicide attempts, 97.5% of the cases attempted suicide by taking a drug overdose or toxic substance, 1.6% by cutting, 0.2% by drowning, 0.2% by jumping from a height, 0.1% by carbon monoxide poisoning, and 0.1% by jumping under a car. Using an overdose of drugs and toxic substances were the most frequent methods of suicide in both genders. While the use of drugs and toxic substances in the males was lower compared to females, attempts by cutting were higher in males (Table 3). It was determined that previous suicide attempt was present in 15.5% of the cases, and 9.1% of cases had another family member with a suicide attempt. It was observed that repetitions of suicide attempt were higher in the females, in cases with suicide attempt in the family, in the cases with psychiatric disease, and in cases with psychiatric disease in the family (Table 4).

**Discussion.** The suicide attempt incidence can show differences from one study to another, even in different regions of a country. As reported by Welch,<sup>4</sup> the annual frequency of suicide attempt changes between 2.6-1100/100,000 in different countries and cultures worldwide. In Europe, the highest rate of suicide

attempt in males was determined to be in Helsinki with 314/100,000, and the lowest in Guipuzcoa at 45/100,000. The highest rate in females was determined to be in France with 462/100,000, and the lowest rate again in Guipuzcoa with 69/100,000.<sup>10</sup> The rates in our study are close to countries with the low rates, but less than the rates in western countries.

**Table 2 -** Distribution of suicide cases according to gender and reasons for suicide from Hatay Province, Turkey.

Reasons for suicide	Male	Female		Total
		n	(%)	
Domestic conflict	114 (33.2)	534	(42.0)	648 (40.2)
Problems with opposite gender	58 (16.9)	178	(14.0)	236 (14.6)
Family violence	42 (12.2)	176	(13.9)	218 (13.5)
Psychiatric disease	43 (12.5)	118	(9.3)	161 (10.0)
Loneliness	7 (2.0)	50	(3.9)	57 (3.5)
Economic problem	27 (7.9)	27	(2.1)	54 (3.3)
Chronic disease	8 (2.3)	40	(3.1)	48 (3.0)
Developmental problems	2 (0.6)	32	(2.5)	34 (2.1)
Education failure	5 (1.5)	28	(2.2)	33 (2.0)
Parental conflicts	11 (3.2)	18	(1.4)	29 (1.8)
Examination anxiety	5 (1.5)	21	(1.7)	26 (1.6)
Losing relatives	4 (1.2)	15	(1.2)	19 (1.2)
Children	1 (0.3)	17	(1.3)	18 (1.1)
Failure at work	11 (3.2)	5	(0.4)	16 (1.0)
Alcohol-substance dependence	5 (1.5)	5	(0.4)	10 (0.6)
Rape	0 (0.0)	6	(0.5)	6 (0.5)
<b>Total</b>	<b>343 (21.3)</b>	<b>1270 (78.7)</b>		<b>1613 (100)</b>

Chi-square = 81.29, degrees of freedom = 15

**Table 1 -** Rates of attempted suicides according to gender, age, education, and marital status in Hatay Province, Turkey.

Variables	Male			Female		
	n	Rate*	Odds ratio (95% confidence interval)	n	Rate*	Odds ratio (95% confidence interval)
<i>Age, years</i>						
<15	1	0.15	1.0	16	2.56	1.0
15-24	190	48.04	314.6 (44.08-2245.03)	814	223.21	87.1 (53.04-142.71)
25-34	109	31.29	204.9 (28.61-1468.07)	324	91.11	35.5 (21.49-58.67)
35-44	31	10.64	69.6 (9.51-510.54)	99	33.64	13.1 (7.73-22.24)
45-54	8	3.66	23.9 (2.99-191.76)	16	7.31	2.8 (1.42-5.69)
≥55	4	1.74	11.4 (1.27-102.09)	1	0.39	0.2 (0.02-0.82)
<i>Education</i>						
No schooling	35	6.99	1.0	140	19.42	1.0
Primary school	172	19.84	2.8 (1.97-4.07)	668	84.50	4.3 (3.62-5.21)
High school and higher	128	34.96	4.9 (3.43-7.26)	427	170.99	8.4 (6.99-10.24)
<i>Marital status</i>						
Married	96	10.35	1.0	559	59.23	1.0
Single	227	45.06	4.3 (3.42-5.52)	638	162.06	2.7 (2.44-3.06)
Widow-divorced	20	53.09	5.1 (3.16-8.29)	73	48.94	0.8 (0.64-1.05)
<b>Total</b>	<b>343</b>	<b>16.11</b>		<b>1270</b>	<b>60.42</b>	

\*per thousand

**Table 3 -** Distribution of suicide cases according to gender and methods of suicide attempt in Hatay Province, Turkey.

Method of suicide	Male	Female n (%)	Total
Drug overdose	321 (93.6)	1252 (98.6)	1573 (97.5)
Cutting	15 (4.4)	11 (0.9)	26 (1.6)
By hanging himself/herself	2 (0.6)	2 (0.2)	4 (0.2)
Drowning	1 (0.3)	3 (0.2)	4 (0.2)
Jumping from the height	3 (0.9)	0 (0.0)	3 (0.2)
Carbon monoxide poisoning	0 (0.0)	2 (0.2)	2 (0.2)
Jumping under a car	1 (0.3)	0 (0.0)	1 (0.1)
<b>Total</b>	<b>343 (21.3)</b>	<b>1270 (78.7)</b>	<b>1613 (100)</b>

Chi-square = 38.65, degrees of freedom = 6,  $p < 0.000$

**Table 4 -** Distribution of risk of repetitive suicide attempt according to some variables.

Variables	Risk of repetitive suicide attempt	
	Odds ratio (95% confidence interval)	P-value
<i>Gender</i>		<0.004
Male	1.0	
Female	1.60 (1.10-2.35)	
<i>Familial suicide attempt history</i>		<0.001
Absent	1.0	
Present	1.64 (1.28-2.11)	
<i>Personal psychiatric disease history</i>		<0.001
Absent	1.0	
Present	2.38 (1.77-3.19)	
<i>Familial psychiatric disease history</i>		<0.001
Absent	1.0	
Present	1.37 (1.07-1.77)	

In general, available data on suicide cover only a particular region of the country. In a study in Trabzon-Turkey,<sup>11</sup> the frequency of suicide and the frequency of suicide attempt in 1995 were reported to be 2.6 per 100,000 and 31.5 per 100,000. In a survey in Mamak, Ankara between 1998 and 2001,<sup>7</sup> the rate of suicide attempt for all groups was reported to be 41.92 per 100,000, and the average annual rates of suicide attempt in males and females were reported to be 25.2 and 61.4 per 100,000. In our study, the rate of suicide attempt is 38.14 per 100,000 for all groups, 16.1 in the males, and 60.42 per 100,000 in the females. This is close to the rates of suicide attempts in previous studies performed in our country.

Over the last 2 decades, significant downward trends in overall suicide rates have been observed in North America and in most countries of Europe.<sup>12</sup> A similar result was found in our study. Our results show that attempted suicide rates decreased in Hatay, from January 2007 to December 2009. However, a period of

3 years is a very short time to make a general decision on suicide rates.

Suicide attempts are higher in females. However, suicide rates in males are 3.5-fold higher compared with the females. However, females attempt suicide is 4-fold more than males.<sup>4</sup> In Europe,<sup>10</sup> it was reported that females attempted suicide more than males. In studies<sup>2,7,13,14</sup> in Asian countries like China, Taiwan, Japan, and in Turkey, the suicide attempts were also found to be higher in females compared to males. To explain this difference, a serial of reasons is suggested such as females use less lethal methods compared with males, prefer more secret methods of seeking help compared with males, have more emotional reactions against force compared with males, and they have more powerful motivations for attracting attention.<sup>6,8,15</sup>

Previous studies<sup>10,15-17</sup> report that suicide attempts are increasing, especially in young people between 15-24 years of age. Various demographic risk factors related to suicide attempt are defined in epidemiological studies. Female gender and young age are reported to be among well known reasons for suicide attempt behaviour.<sup>4,16</sup> Two studies from Turkey,<sup>7,15</sup> defined being in the 15-24 year age group and female as potential risk factors for suicide attempts. We also observed a much higher suicide attempt rate in the 15-24 age groups, and in females. Adolescence is a period where the efforts of separation and individualization begin, the system of value judgment is settled, and instability and chaos for bodily, mental, and social aspects are experienced. Women and adolescents can be easily daunted, leading to loss of self-confidence due to generation conflicts, pressures, and restrictions applied by the families, and intensity of exams in this period. Psychological problems develop due to these reasons, and also to problems related to marriage.<sup>15</sup> We found higher suicide attempt rates in the unmarried compared with married subjects. It was observed that being single increased the risk of suicide attempt approximately 4-fold in the males, and 3-fold in the females. Similar results were obtained also in previous studies,<sup>4,10,18</sup> and it was reported that being single or divorced was a risk factor for both suicide attempt and thoughts of death. In the literature,<sup>4,19</sup> it is reported that being married and having a child has a protective effect for suicide.

Some studies<sup>10,20</sup> reported low education level as a risk factor for suicide attempt. Contrary to this, rates of suicide attempt increased with education level in our study. A similar result was found in another study from Spain.<sup>21</sup> When the concept of "suicide attempts are maximal at 15-24 years of age and the education level of this age group is high" is taken into consideration, this can be an indirect relation.

Domestic conflict is one of the most common reasons reported to be a factor in suicide attempts. Also in this study, domestic conflict was the most common factor leading to suicide attempt in both genders. Similarly, other studies<sup>15,22</sup> determined this to be a factor leading to suicide attempt most frequently. Regarding gender, it was reported more frequently in females compared with the males. Economic problems are a more frequent reason in suicide attempt in males compared with the females.

The aim of most suicide attempts is continue to live under changing conditions rather than to die. In this respect, a suicide attempt is a cry for help. Few individuals attempting suicide have the intention to die, and therefore less deadly methods are frequently preferred. Drugs and similar substances are usually preferred since they are available easily. For these reasons, many publications<sup>1,2,7,10,15-17</sup> report that suicide attempts are usually realized taking a drug overdose. We found similar results.

We found that 63.2% of the cases attempting suicide by taking an overdose of a drug-toxic substance were in the 15-24 age groups. Similarly, studies<sup>7,10,14,15,17</sup> from different countries reported that most adolescents attempting suicide chose an overdose of drug-toxic substance. We found that drug and toxic substance use were lower in males than females, while attempts with cutting were higher in males. Males prefer different methods of suicide compared with females. In both completed suicides and in suicide attempts, males prefer more lethal and conclusive methods of suicide, such as cutting, when compared with females.<sup>2</sup>

Repetition is a basic characteristic of suicidal behavior. Individuals with a previous suicide attempt are at a greater risk of suicide than the general population.<sup>23</sup> Mert et al<sup>22</sup> found that 19.7% of subjects had at least one previous suicide attempt. Another study<sup>2</sup> reported a rate of 24% for at least one previous suicide attempt among 15-45 year olds. We found a lower repetition rate of 15.5%. This figure is very important when considering that suicide attempts are reported per 100,000. Suicide attempts should be given serious consideration in the reduction of complete suicides.

Various studies<sup>2,16</sup> found an association between presence of mental disorder and repetitive suicide attempt. The presence of familial mental disorder history is among the risk factors for suicidal behavior, as it leads to both genetic and environmental predisposition to mental disorders. These studies<sup>8,24</sup> also reported that the presence of mental problems in relatives was one of the most important risk factors. Individuals with a familial suicide attempt history have a higher rate of suicide attempts. A general population study<sup>25</sup> demonstrated

that suicidal ideation and risk of suicide attempt increased markedly in individuals with familial suicide attempt history.

Consistent with the literature, we found that the presence of psychiatric disease history in the individual and his/her family was a risk factor related to repetitive suicide attempts. We also determined that risk of suicide attempt was higher in individuals with a history of familial suicide attempt. We observed that the risk of suicide attempt increased 2.38-fold in individuals with psychiatric disease, 1.37-fold in individuals with psychiatric disease in the family, and 1.60-fold in the individuals with suicide attempt in the family.

**Study limitations.** Most of the data were based on the hospital records, with a lack of detailed information regarding the cases, and we could not perform further analyses on the data. Three years is a short period of time to make a decision regarding trends, and the data represent only one province, therefore the results can only be generalized for the population of Hatay province.

In conclusion, the incidence of suicide attempt in this study is similar to countries with lower incidences, and our results are similar to previous studies performed in Turkey. Youths, females, singles, individuals with high education, and psychiatric history in the family are at a higher risk of suicide attempt. We found a drug overdose to be the most common suicide attempt method, and domestic conflict the most common reason for a suicide attempt. Repetition of suicide attempts is high, and a suicide attempt is an important signal for prevention of completed suicide. The presence of psychiatric disease history in individuals and the family is a risk factor in terms of repetitive suicide attempts. This is a subject of great importance, and programs aimed at preventing repetitive suicide attempts should be developed.

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