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# Deaths over 65 years of age alleged suicide

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**Abstract**
In our study, it was aimed to obtain data on the cases' demographic characteristics, causes of suicide, characteristics of suicides, the places where the suicides took place, and to compare the obtained data with the literature and to make recommendations for the prevention of elderly suicides by examining elderly deaths with alleged suicide. Between 2008 and 2017, crime scene investigation and corpse inspections records as well as autopsy reports of 447 cases aged 65 and over with alleged suicide that were autopsied in the Morgue Specialization Department of Forensic Medicine Institute, İzmir Group Chairmanship, were retrospectively examined. 74.9% and 25.1% of our cases were male and female, respectively. When we looked at suicide methods, it was seen that nearly half of the cases (49.7%) used the hanging method. When we look at the factors that may be the cause of suicide, physical illness was identified as the leading reason in 23.3% of the cases. It was found that 7.6% of the cases had previously attempted suicide, 12.1% of them had suicidal thoughts recently. Risk factors in elderly suicides must be determined and the whole community, especially those with the elderly individuals nearby must be informed by the government and non-governmental organizations in order to raise awareness about the suicides in this period.

**Keywords:** Elderly suicides, forensic medicine, autopsy

## Introduction

Suicide is the greatest act of violence against one's own self and the individual's voluntary termination of life by preferring death over life [1]. The rough suicide rate refers to the number of suicides per hundred thousand population, which is about 10.7 in 2015 for all the world [2]. In our country, the rough suicide rate was 2.67 per hundred thousand in 2000, 3.75 per hundred thousand in 2005, 4.02 per hundred thousand in 2010, and 4.15 per hundred thousand in 2015, in other words, four out of every hundred thousand committed suicide in our country in 2015 [3]. According to our current penal codes, suicide is not a crime on its own and crime of suicide solicitation has been regulated in order to punish the acts constituting suicide. For this reason, since all suicide cases are forensic in medicolegal respect, forensic cases should be reported and forensic autopsies must be performed in completed suicide cases when suicide attempts are encountered [4].

Although there is no definite age limit, old age, which is generally defined as over 65 years of age, is a period in which the inadequacy of physical and mental functions increases significantly [5]. According to the predictions of the World Health Organization, the population over 60 years of age, which is approximately 900 million in 2015, is estimated to reach 2 billion by 2050, in other words, 21% of the world population [6]. According to the data in our country, the rate of the population over 65 years of age to the whole population was 4.4% in 1970 and 6.7% in 2005 and 8.2% in 2015, respectively [7]. The elderly population in our country is estimated to reach 16.3% in 2040, 22.6% in 2060 and 25.6% in 2080, respectively [8].

When life periods are examined, one of the stages in which suicide intensifies is the old age, and the rate of completed suicides increases with age [5]. Among the most important factors driving the elderly suicide are medical reasons such as physical or mental illnesses, the death of an elderly person's relative, marital conflict, the dependence on others and economic problems [5,9].

In our study, deaths over 65 years of age with alleged suicides were examined and it was aimed to obtain data on the cases' demographic characteristics, causes of suicide, characteristics of suicides, the places where the suicides took place, and to compare the obtained data with the literature and to make recommendations for the prevention of elderly suicides.

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## Material and Methods

In the decade between 2008 and 2017, the autopsy reports of 20482 cases who were autopsied in the Morgue Specialization Department of Forensic Medicine Institute, İzmir Group Chairmanship and the crime scene investigation as well as corpse inspections records were examined retrospectively and among 4397 cases aged 65 and over, 447 cases with alleged suicide were included in the study.

Factors such as cases' sociodemographic data like age, sex, suicide time, suicide method, place of suicide, causes of suicide, previous suicide attempts, and whether or not there was a suicide note were evaluated. For statistical analysis, the data were evaluated using 22.0 version of SPSS (Statistical Program for Social Science) programme and the number and percentages were used for the data.

## Results

In this period, 21.4% of the forensic autopsies constitute elderly autopsies. Elderly autopsies with alleged suicide constitute 10.1% of all elderly autopsies and 2.1% of all autopsies. The distribution of total autopsies, elderly autopsies and elderly autopsies with alleged suicide by years is given in Graph 1.

Three hundred thirty-five (74.9%) of the cases were male, 112 (25.1%) of them were female, and the male / female rate was 2.9. The ages of the cases ranged from 65 to 103 years and the average age was 75.2 (±7.3). Our cases were classified as "young and old" between 65-74 years of age, "middle aged" between 75-84 years of age, "elderly" between 85 years and older, and it was found that "young and old" group was consisted of 225 cases (50.3%), the "middle aged" group was consisted of 173 cases (38.7%) and the "elderly" group was consisted of 49 cases (11%). The distribution of age groups by sex is shown in Table 1.

When we look at the suicide methods, nearly half of our cases (n = 222, 49.7%) were found to use the hanging method. This was followed by the use of firearms with 19.5% (n=87), chemical substance intake with 15.2% (n=68), jumping from height with 8.5% (n=38), drowning with 2.7% (n=12), the use of sharp instruments with 2.5% (n=11). Three cases (0.7%), one case (0.2%) and one case (0.2%) ended their lives by burning themselves, by suffocating themselves with the knotting method and by removing the central catheter inserted for medical purposes respectively. In addition, complex suicide was seen in four cases (0.8%). Two cases died due to chemical substance intake and hanging, one case died because of the use of sharp instruments and chemical substance intake and one case died because of jumping from height, the use of sharp instruments and chemical substance intake. When the distribution of suicide methods by sex was examined, it was found that the second most commonly used method was the use of firearms in male cases and chemical substance intake in female cases while hanging was the most commonly used method in both sexes (Table 2).

When the distribution of the cases according to the seasons in which they committed suicide was examined, it was seen that they committed suicide most frequently in spring (n=126, 28.2%) and summer (n=121, 27.1%) and at least in autumn (n=96, 21.5%). According to sex, it was found that male cases committed suicide most often in spring (n=94, 28.1%), at least in autumn (n=74, 22.1%), on the other hand, female cases committed suicide most frequently in summer (n=33, 29.4%), at least in autumn (n=22, 19.6%). When the suicide hours of the cases were compared with gender, it was seen that male cases committed suicide most frequently between 06.01-12.00 hours (n=90, 34.7%), at least between 18.01-00.00 hours (n=27, 10.4%), and female cases committed suicide most frequently between 12.01-18.00 hours (n=35, 37.6%) and at least between 18.01-00.00 hours (n = 6, 6.4%) among the cases with known suicide hour.

The places where the cases chose to commit suicide were classified as interior of the house where they lived, outbuildings (such as basement, terrace, outhouse), the open area near the house (such as the garden of the house), the open area (such as forestland, cemetery), in-car, in the hospital and the workplace. While the male / female rate was 2.6 for interior of the house where they lived, this rate increased to 5.4 in open area in suicide cases, and it was noted that all suicide cases in the places such as workplace, in-car and hospital were male. The relationship between sex and crime scenes in which suicides took place is given in Graph 2.

During the corpse examination of a deceased person, a relative's information is used for forensic identification or as a witness. As in our cases, the existence of the reason that drives suicide in cases where suicide is considered in the first plan, the discourse and behaviours in recent times are often questioned at this stage. However, there are also cases where only identification is made and although there is an allegation of suicide, the questioning is not carried out in the first stage. In the documents examined, information on whether or not 82 cases (18.3%) were a cause of suicide could not be reached. In the evaluation of 365 (81.7%) cases in which information was provided by those who knew the deceased person, it was stated that there were no negative factors that would cause suicide in 147 cases (32.9%). If we look at factors that may be the cause of suicide, physical illness (such as cancer, complications arising from diabetes and hypertension, chronic renal failure in need of dialysis) in 104 cases (23.3%), the death of a relative (spouse, child, sibling, friend) in 28 cases (6.3%), economic reasons (such as low income, debt, fraud, bankruptcy) in 27 cases (6%), an effect of a psychiatric disease (such as schizophrenia, bipolar disorder, major depression) in 25 cases (5.5%), marital conflict (such as inability to agree with a spouse or children) in 18 cases (4%) has been identified as the leading reasons. In addition, negative factors such as incompatible with social life (such as after migration) in five cases (1.1%), sick of life in four cases (0.9%), legal procedure (such as making detention decisions, explaining the provision) in three cases (0.7%), feeling like as a burden in one case (0.2%), disease of spouse or child in one case (0.2%), divorce in one case (0.2%), suicide after murder in one case (0.2%), were encountered. When we look at the distribution of the factors causing suicide by sex, among the causes that can be detected, physical disease was found to be the highest in both sexes (Table 3). When change in the negative factors causing suicide were examined according to age groups, it was observed that physical diseases are the most common cause of suicide in all age groups among the detectable reasons. In addition, the rate of physical diseases as a cause of suicide rises with increasing age.

When the history of suicide attempt was examined, it was found that 282 (63.1%) of the total 447 cases did not attempt suicide before, 34 cases (7.6%) had previously attempted suicide, and 54 cases (12.1%) had suicidal thoughts recently. For the remaining 77 cases (17.2%), no data on suicide attempt or thought was available.

It was determined that there were no suicide notes in 364 of our cases (81.4%) and there were suicide notes in 48 of the cases (10.8%). In the remaining 35 cases (7.8%), no data could be reached on whether there was a suicide note. 95.8% of the cases who left a suicide note were male and 4.2% of them were female. The suicide notes left by some of the cases were summarized as "No one is responsible for my death, I'm tired of living, thanks for everything you have done for me.", "Give my drugs to the health centre, it's been a nightmare to live now.", "I can't pay my debts, no one has a responsibility, Goodbye.", "No one is responsible for this murder, my pain has increased so much, I can't bear it, no one has fault.", "My son tortures me a lot, so I commit suicide.", "No one is responsible for my death, I have no power to stand.", "I am lonely, I am depressed I have chosen this path, no one has a responsibility.", "No one has fault, I couldn't bear my illness".

**Table 1.** The distribution of age groups by sex

| Sex/ Age Groups | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| **Young and Old (65-74 years of age)** | 175 | 52.3 | 50 | 44.7 | **225** | **50.3** |
| **Middle Aged (75-84 years of age)** | 133 | 39.7 | 40 | 35.7 | **173** | **38.7** |
| **Elderly (85 years and older)** | 27 | 8.0 | 22 | 19.6 | **49** | **11.0** |
| **Total** | **335** | **100** | **112** | **100** | **447** | **100** |

**Table 2.** The distribution of suicide methods by sex

| Sex/ Suicide Methods | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| **Hanging** | 159 | 47.4 | 63 | 56.2 | **222** | **49.7** |
| **Use of Firearms** | 87 | 26.0 | 0 | 0.0 | **87** | **19.5** |
| **Chemical Substance Intake** | 44 | 13.1 | 24 | 21.4 | **68** | **15.2** |
| **Jumping From Height** | 24 | 7.2 | 14 | 12.5 | **38** | **8.5** |
| **Drowning** | 8 | 2.4 | 4 | 3.6 | **12** | **2.7** |
| **Use of Sharps** | 8 | 2.4 | 3 | 2.7 | **11** | **2.5** |
| **Burning Themselves** | 1 | 0.3 | 2 | 1.8 | **3** | **0.7** |
| **Suffocating Themselves** | 0 | 0.0 | 1 | 0.9 | **1** | **0.2** |
| **Removing the Catheter** | 0 | 0.0 | 1 | 0.9 | **1** | **0.2** |
| **Complex Suicide *** | 4 | 1.2 | 0 | 0.0 | **4** | **0.8** |
| **Total** | **335** | **100** | **112** | **100** | **447** | **100** |

(*Two cases chemical substance intake+hanging, one case use of sharps+chemical substance intake, one case jumping from height+use of sharps+chemical substance intake)

**Table 3.** Distribution of the factors causing suicide by sex

| Sex/ Factors Causing Suicide | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| **No** | 102 | 30.4 | 45 | 40.2 | **147** | **32.9** |
| **Physical illness** | 81 | 24.2 | 23 | 20.5 | **104** | **23.3** |
| **Death of a Relative** | 18 | 5.4 | 10 | 9.0 | **28** | **6.3** |
| **Economic Reasons** | 26 | 7.7 | 1 | 0.9 | **27** | **6.0** |
| **Psychiatric Disease** | 17 | 5.1 | 8 | 7.1 | **25** | **5.6** |
| **Marital Conflict** | 16 | 4.8 | 2 | 1.8 | **18** | **4.0** |
| **Other*** | 9 | 2.7 | 7 | 6.2 | **16** | **3.6** |
| **Unspecified** | 66 | 19.7 | 16 | 14.3 | **82** | **18.3** |
| **Total** | **335** | **100** | **112** | **100** | **447** | **100** |

(*Legal procedure, feeling like as a burden, disease of spouse or child, divorce, suicide after murder, incompatible with social life)

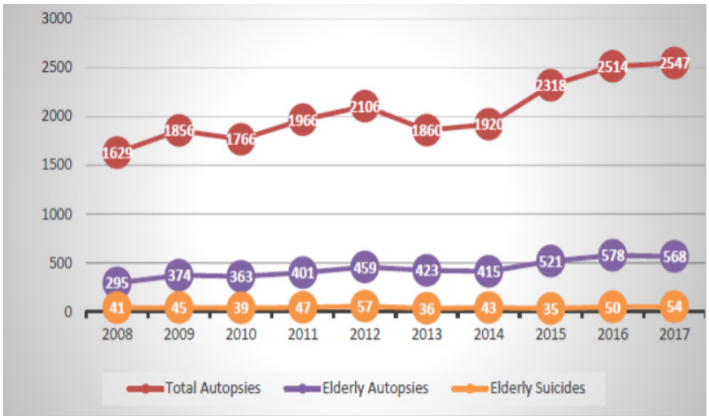
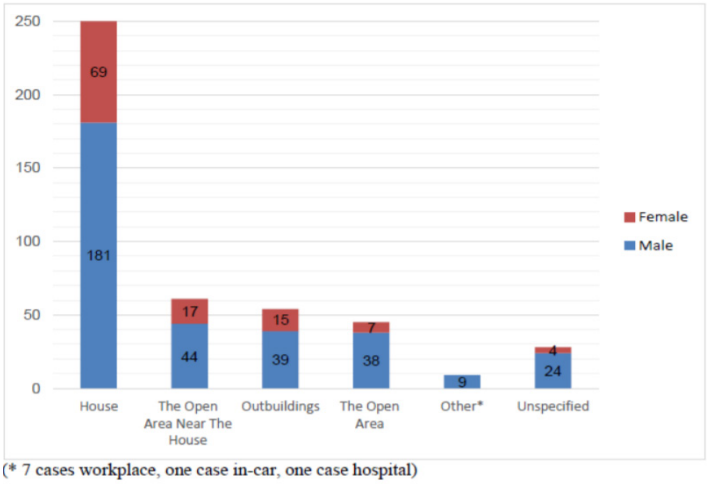



**Figure 1.** Distribution of autopsies by years




(* 7 cases workplace, one case in-car, one case hospital)

**Figure 2.** The distribution of crime scene by sex

## Discussion

It was found in the studies conducted in Aydın, Adana and Erzurum that the rates of elderly suicides in elderly autopsies were 11.5%,

8.7% and 6.2%, respectively [10-12]. In a study conducted in the USA, this rate was found to be 11.5% [13]. In our study, similar to the literature, elderly suicides constitute 10.1% of elderly autopsies.

Male sex is a risk factor for elderly suicides [5]. Studies in the world and in our country show that the male/female rate in elderly suicides changes between 2.8 and 6.2 [14-16]. In our study, this rate was determined as 2.9 in line with the studies in the literature.

In many studies conducted in our country in which all age groups were examined, the most preferred suicide methods were determined as hanging between 40.6% and 52.3%, the use of firearms between 22.2% and 36.7%, chemical substance intake between 9% and 17.7% and jumping from height between 6.8% and 10.2%, respectively [14,17-19]. When we look at the elderly suicides, the most commonly used methods according to Turkish Statistical Institute (TSI) data were hanging, firearm injury, jumping from height and chemical substance intake [20]. In a study conducted in Eskişehir, hanging was found to be the most common suicide method in the elderly with 60.8% [21]. In a study conducted in South Australia, it was found that the most preferred suicide methods of the elderly were hanging (24%), the use of firearms (21.6%), chemical substance intake (18.4%), drowning (14.8%) [15]. In the USA, the use of firearms was the most common suicide method in elderly suicides [9]. In our study examining elderly suicides, it was found that the most common suicide methods were hanging (49.7%), firearm use (19.5%), chemical substance intake (15.2%), jumping from height (8.5%). Our findings are similar to the studies conducted with all age groups in our country.

In a study indicated that suicides intensified during the summer months [18]. However, there are studies indicating that suicides are more common in the spring [14,22]. In our study, the elderly committed suicide mostly in June (11.2%) and seasonally in spring (28.2%).

In a study conducted in Istanbul in which all age groups were included, it is stated that 70.2% of suicide cases chose during the day for this action [23]. In our study, the cases performed suicide during the day mostly such as 06.01-12.00 (27.5%) and 12.01-18.00 (26.8%) in accordance with the literature.

In the studies conducted, the most frequent crime scenes where suicides occurred were found to be home and home environment at rates ranging from 42.6% to 73.9% [1,2,5,9]. In our study, it was found that the most frequent crime scene was (55.9%) domestic, the second most frequent crime scene was (13.6%) open area near the house, the third most frequent crime scene was (12.6%) outbuilding and the fourth most frequent crime scene was (10.1%) open area. In general, it is seen that elderly people prefer the interior of their houses which they lived and their localizations close to their houses (interior of the house + open area near the house + outbuilding; 82.1%) for suicide.

In many studies examining elderly suicides in the world and in our country, physical diseases and the burdens that these diseases bring to the elderly are pointed out among the reasons that can be determined as the etiology of suicide [5,20,24]. However, psychiatric diseases, economic and social reasons are mentioned as other reasons leading to suicide [5,24]. It is not always possible to determine the etiology that causes suicide, by creating a gap behind it, the cases with unknown reasons for suicide constitute a large group. According to TSI data, when the cause of elderly suicides is examined, the largest group consists of the suicides with unknown reasons [20]. In our study, the factors which are classified as negative factors and which are prominent as the cause of suicide were identified as 23.3% physical illness, 6.3% death of a relative, 6% economic reasons, 5.6% psychiatric illness, and 4% marital conflict. Legal procedure, divorce, sick of life, feeling like as a burden, suicide after murder are other negative factors. In 18.3% of the cases, no information could be obtained about this subject, while the largest group was the elderly with 32.9% whose relatives stated there was no cause of suicide.

The most common cause of suicide in both sexes in elderly cases is stated as the disease [20]. Moreover, it was found that while economic reasons were more suicidal in male cases, psychiatric diseases and loss of a relative were more suicidal in female cases [22]. In our study, it was observed that both sexes had the highest rates of physical diseases among the detectable causes of suicides. It was found that while economic reasons and marital conflict were higher in male cases than in female cases, the death of a relative and psychiatric diseases were higher in female cases than in male cases.

Studies involving all age groups found that 16.1% and 42.1% of suicidal cases left a suicide note [13,22,23]. It is stated that the rates of leaving suicide note fell at an older age, and that male cases left more suicide notes than female cases [22,25]. In our study, in accordance with this information, 10.8% of the cases left suicide letters and the rate of leaving suicide letter was higher in male cases.

When the reasons leading to suicide in elderly individuals were examined in our study, it was learned from their relatives that there was no reason at the rate of 32.9%. This is a high rate for us. It is thought that irreversible death is a necessary reason(s) in the selection by an individual who is in the last stages of his or her life. The problems that cannot be overcome by the elderly and make death preferable might not be noticed by their relatives or seen as the cause of death. Raising the awareness of old age, the elderly and the people who live with, take care of or assist in the care of the elderly will provide a better understanding of the process leading to the elderly suicides and cause less suicide without reason.

Old age is by nature a difficult period of physical and mental disability arising limitations. Furthermore, the physical diseases of the elderly, the burdens caused by these diseases make life more intolerable. If we give examples from our cases in our study, exposure to dialysis for many years due to chronic renal failure, anatomical loss after amputation due to advanced diabetes, addiction caused by disability occurring after cerebrovascular event, hypoxia which the elderly described as a feeling of inability to breathe and suffocation caused by advanced lung disease, the burden of cancer diagnosis or chemotherapy process and more intolerable pain makes death more attractive than life. It is important here to raise awareness among the elderly and not to interfere with the psychological support treatment in addition to the treatment of organic disease. Furthermore, physicians should also recommend taking psychiatric support in such severe cases that occur in geriatric patients and this should be considered as a

part of the treatment.

Previous suicide attempts are a risk factor for suicide. Moreover, suicide which is in the dimension of thought for a person is a situation which should be taken into consideration and precautions should be taken. In our study, it was found that 7.6% of the cases had previously attempted suicide and 12.1% of them had suicidal thoughts recently. That is to say, 19.7% of our cases, in other words one of the five elderly cases who committed suicide, had alarm bells ringing for suicide. It should be understood that the elderly, who stated that he no longer wanted to live because of his illness, that he had to die because he was a burden to his relatives, that killing himself for various reasons was the only remedy, was actually a cry for help by saying these things. Relatives of the elderly should not perceive these statements as an ordinary reaction seen in old age, should focus on them carefully and try to solve the problem of the elderly.

Family practice and home care services are a system in which successful projects will be implemented for the prevention of elderly suicides. The fact that health professionals should periodically subject the elderly individuals to mental state examination and guide the elderly which they deem necessary to psychiatry clinics if necessary will enable the elderly individual to reach professional psychological support easily and without delay. In addition, considering the conditions that may be risk factors for elderly suicides such as severe chronic illness, advanced disability, losing a relative recently, the elderly with these risk factors are considered more frequently and they may be guided to psychiatry clinics for a more detailed examination and professional observation even if no psychopathology is detected in the mental state examinations.

**Conflict of interest**
*The authors declare that there are no conflicts of interest.*

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**Ethical approval**
*The study was approved by the Ethics Committee of Manisa Celal Bayar University.*

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