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Original Article

## Evaluation of fatal traffic accident cases that occurred in Tokat province

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### Abstract

**Aim:** Traffic accidents are one of the important study subjects among forensic medical practices. In our study, it was aimed to evaluate the demographic characteristics of the deaths due to traffic accidents in Tokat province from a forensic perspective and to offer solutions to traffic accidents, which are an important public health problem for our country.

**Materials and Methods:** In this study, the dead examination and autopsy reports performed on traffic accident cases by Gaziosmanpaşa University Faculty of Medicine Department of Forensic Medicine between January 2013 and January 2018 were retrospectively examined, and a total of 138 cases were examined according to age, gender, scene of incident, place of death, cause of death, vehicle type. , were evaluated in terms of whether the victim was inside/outside the vehicle, driver/passenger/pedestrian, trauma area, bone fractures and the distribution of the cases according to months and years.

**Results:** In our study, 138 (33.1%) of a total of 419 death examination and autopsy cases performed by our Department between 2013 and 2017 were caused by traffic accidents, the average age of these cases was 45.42 (SD±23.25) and 111 of them were male (80.44%), 27 of whom were women (19.56%), the average age for men was 47.37 (SD±22.32), and for women this number was 37.37 (SD±25.61) and the cases were between the ages of 0-90. There was an increase in fatal traffic accidents in 2016 compared to other years, and when the frequency of occurrence by month was evaluated, it was determined that the most frequent fatal traffic accident was in September.

**Conclusion:** It was determined that there was an increase in the number of fatal traffic accidents in Tokat province within the specified five years, especially in the summer months, and that urban traffic accidents were more than out-of-city traffic accidents as a result of limited public transportation opportunities and people traveling more with their personal vehicles.

**Keywords:** Traffic accident, death, autopsy

### INTRODUCTION

Traffic; it is defined as the movements and situations of pedestrians, animals and vehicles on the highway. Traffic accident is an important public health problem that results in death, injury and damage involving one or more moving or stationary vehicles or people on the highway [1]. According to World Health Organization 2023 data; every year, approximately 1.19 million people die in traffic accidents in the world and 17.8 million people are seriously injured [2]. According to Institute

For Health Metrics And Evaluation 2016 data, one of the top 10 most common causes of death worldwide is traffic accidents, and injuries due to traffic accidents are one of the most common causes of trauma-related deaths [3]. It is reported that the risk of death resulting from a traffic accident is higher than other traumas. Traffic accidents have become the most common cause of trauma-related deaths in young adults [4]. The World Health Organization announced that the most common cause of death for people aged 5-29 in 2023 is traffic accidents [2].

### CITATION

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In this study, we aimed to retrospectively evaluate the autopsy reports of traffic accidents that occurred in Tokat between January 2013 and January 2018, to offer solutions to traffic accidents, which are a serious problem for our country and the world, and to contribute to our country's statistics by examining deaths due to traffic accidents.

## MATERIAL AND METHOD

In our study, a total of 419 corpse examination and autopsy reports prepared by Tokat Gaziosmanpaşa University Health Practice and Research Hospital, Department of Forensic Medicine between 2013 and 2018 were retrospectively examined. It was understood that 138 (33.1%) of the cases examined died due to traffic accidents. Demographic characteristics of 138 cases who died due to traffic accidents were evaluated. Cases include age, gender, month and year of death, whether the death occurred at the scene or in the hospital, where the event occurred, whether a death examination or autopsy was performed, cause of death, whether histopathological and/or systemic toxicological samples were taken during the autopsy/examination of the dead, whether CPR was performed or not. The type of vehicle that caused the accident, whether the victim was inside or outside the vehicle, whether the victim was a driver/passenger/pedestrian, whether the accident was one-sided/double-sided, the trauma area of the victim, existing organ damage and bone fractures were investigated. Whether it is compatible with worldwide rates or not was discussed in the light of the literature.

Descriptive analyzes were performed to give information about the general characteristics of the study groups. Data belonging to continuous variables are in the form of mean±standard deviation and median minimum and maximum values; data on categorical variables were given as n (%). Ready-made statistical software was used for calculations (SPSS 22.0 Chicago, IL, USA).

Ethics committee approval was obtained with the decision numbered 24-KAEK-231 by Tokat Gaziosmanpaşa University Faculty of Medicine Clinical Research Ethics Committee.

## RESULTS

It was determined that the cause of 138 (33.1%) of 419 forensic death cases, where death examination/autopsy was performed by Tokat Gaziosmanpaşa University Forensic Medicine Department between January 2013 and January 2018, was a traffic accident. It was determined that the youngest of the victims who were examined or autopsied was 8 days old, the oldest was 90 years old, and the average age of all cases was 45.42 (SD±23.25). It was determined that 111 (80.44%) of our cases were male and 27 (19.56) were female, and the average age in our study group was 47.37 (SD±22.32) for men and 37.37 (SD±25.61) for women. It was determined that the number of men was 4.1 times the number of women, and the age and gender distributions are shown in Figure 1. It was observed that 14 of the male cases and 8 of the female cases were under the age of 18, and deaths due to traffic accidents in both genders occurred most frequently in the 60-69 age group.

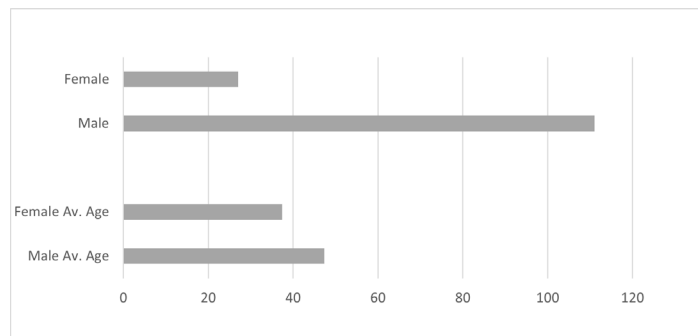


Figure 1. Number of male-female and average age

In our study, it was determined that deaths due to traffic accidents occurred most frequently in 2016, and by month, the most frequent deaths occurred in September. It was observed that there were significantly fewer fatal traffic accidents in the winter months of December, January and February compared to other months, and when evaluated according to seasons, the highest number of deaths occurred in the summer. The distribution of death cases by months is shown in Figure 2.

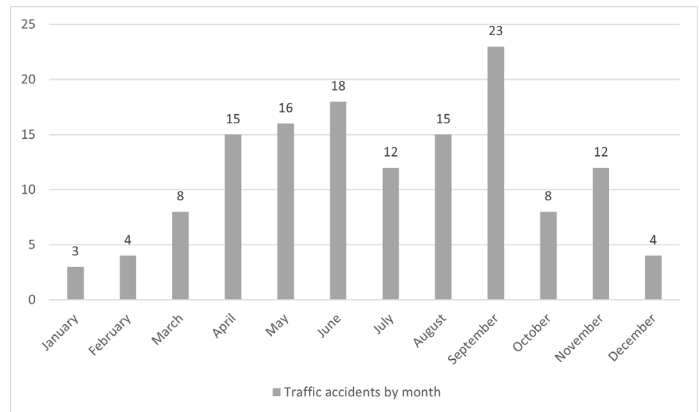


Figure 2. Traffic accidents by month

When the places where accidents occur are evaluated; It was observed that the most fatal traffic accidents occurred in city centers. It was determined that 115 of the cases were hospitalized and 23 cases were declared dead at the scene. It was determined that CPR was applied to 114 of the cases.

It was understood that only dead bodies were examined in 109 of the cases, while autopsy was performed in 29 cases. It was determined that systemic toxicological analysis was requested in 32 of the 138 cases where autopsy or death examination was performed, and both systemic toxicological analysis and histopathological tests were requested in 14 cases, and no examination was deemed necessary in 88 cases.

In our study, it was determined that the most common accident occurred with a car, with 88 cases. It was observed that 24 of the fatal traffic accidents occurred with tractors, 13 with motorcycles, and 11 with trucks, pickup trucks and trailers. It was determined that 72 of the victims were inside the vehicle and 66 were outside the vehicle at the time of the accident. It was determined that 59

of the accidents were bilateral. It was determined that 56 victims were drivers, 52 were passengers, and 30 were pedestrians.

When our study is evaluated in terms of causes of death; It was determined that the cause of death was head trauma in 69 cases (50%), head trauma was followed by internal organ damage and internal bleeding in 29 cases, and medulla spinalis injury was in 2 cases. While isolated head and neck trauma was observed in 43 cases, all cases with head and neck trauma, including cases with trauma to more than one region, were observed to be 91. It was determined that 12 cases had trauma only to the chest area, 2 cases had trauma to the abdomen/pelvis area, and 80 cases had trauma to more than one area. In fatal traffic accidents, brain damage was the most common in 57 cases, lung damage in 35 cases, multiple organ damage in 36 cases, bones in the craniofacial bones in 75 cases, ribs and sternum in 63 cases, pelvis in 8 cases, vertebrae in 13 cases, and extremities in 14 cases. It was observed that there were fractures and there were no bone fractures in 9 cases. The distribution by cause of death is shown in Figure 3, and the distribution of bone fractures is shown in Figure 4.

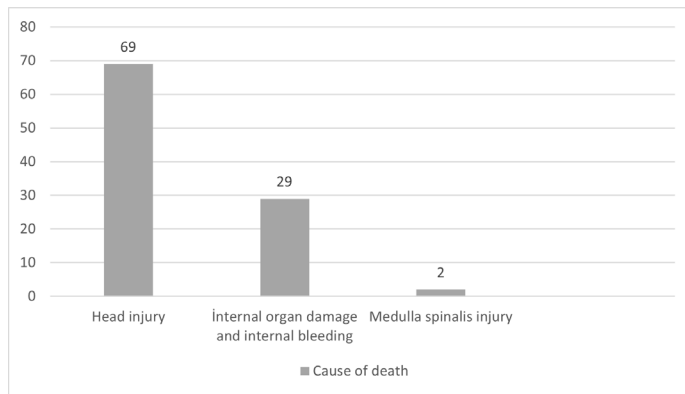


Figure 3. Cause of death

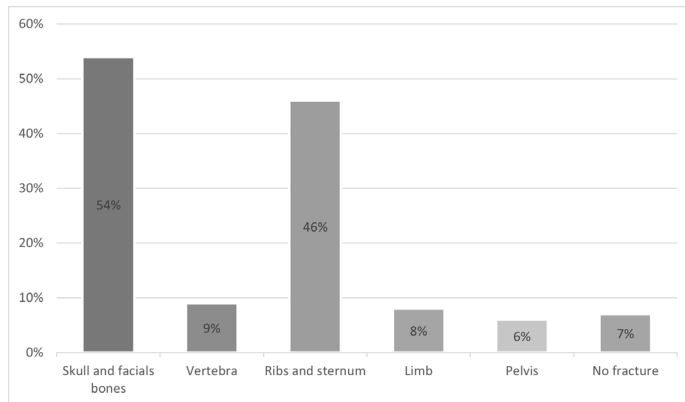


Figure 4. Bone fractures

## DISCUSSION

The number of people and vehicles in the world is increasing rapidly every day. Since the most commonly used method of transportation is road, traffic accidents have become a global problem causing significant mortality and morbidity worldwide. According to Turkish Statistical Institute 2023 data, it has been

reported that a total of 1,314,136 accidents occurred on our country's highways and 235.71 of these accidents were accidents with injuries and deaths, and a total of 6548 people lost their lives in these accidents [5]. In Tokat province, it was reported that 6016 traffic accidents occurred in 2023 and a total of 84 people lost their lives in these accidents [5]. While the number of motor vehicles in traffic in Türkiye will increase by 8.5% in 2023 compared to the previous year, total number of accidents 6.6%, number of accidents involving death and injury 19%, total death toll is 25% and number of injured 21.5% is reported to have increased [6].

In our study, it was determined that 138 (33%) of 419 forensic cases conducted by our Department in Tokat province in the 5-year period between January 2013 and January 2018 were due to traffic accidents. In the literature, this rate was found to be 22% in a study conducted in Diyarbakır, 38.8% in a study conducted in Eskişehir, and 28% in a study conducted in Denizli [7-9]. A study conducted in India reported that 50% of unnatural deaths in children under the age of 18 were due to traffic accidents [10]. Although there are regional differences, it is reported that traffic accidents constitute approximately 1/3 of forensic cases in our country and traffic accidents generally come first.

In our study, it was determined that 111 (80%) of the cases were male and 27 (20%) were female, and the male/female ratio was determined to be 4.1. In a study conducted in Ankara, it was stated that the rate of men dying in traffic accidents was 72.6%, and in a study conducted in Diyarbakır, it was 75% [7,11]. According to Turkish Statistical Institute 2023 data, it was determined that 75% of those who died in traffic accidents were men and 25% were women [5]. The higher number of male deaths in traffic accidents is due to the fact that men are more present in traffic and the vehicle drivers are mostly men. In our study, the average age was 45.42 in all cases, 47.37 in men and 37.37 in women, and it was observed that death occurred most frequently in the 60-69 age group in both genders. In a study conducted in Denizli, it was reported that the average age was 48.5 and deaths occurred most frequently in the 60-69 age group. In a study conducted in Adana, it was reported that the average age was 37.6 and deaths occurred most in the 0-10 age group [9,12].

When deaths due to traffic accidents were evaluated by month, it was seen that the most deaths occurred in September, in line with studies conducted in Türkiye and around the world. According to Turkish Statistical Institute 2023 data, deaths due to traffic accidents occurred most frequently in July, and according to Turkish Statistical Institute 2022 data, deaths due to traffic accidents occurred most frequently in August [5,6]. It is stated that deaths due to traffic accidents are at least in February [6]. It is thought that the increase in traffic accidents and deaths related to these accidents in the summer months is due to the increase in vehicle and pedestrian density in traffic. In our study, when the deaths due to traffic accidents were evaluated according to the location of the incident, it was seen that the most deaths occurred in city centers with 98 (71%) cases. According to



Turkish Statistical Institute 2023 data, 83.1% of traffic accidents involving death and injury occurred in residential areas and 16.9% occurred outside residential areas [5].

In forensic cases, it is critical to perform a systematic autopsy to determine the exact cause of death. Determining the exact cause of death in traffic accidents is of critical importance both in the later stages of the forensic investigation and in eliminating claims that may arise later in insurance cases. However, in practice, it is seen that in traffic accidents, burial licenses are generally issued only after examining the dead. In our study, it was determined that autopsy was performed on only 29 of 138 cases (21%), and the cause of death in 109 cases was determined by examination of the dead. In a study conducted in Ankara, it was reported that 6.2% of the fatalities resulting from traffic accidents were subjected to autopsy, and 93.8% were given burial licenses after examination of the dead [11].

When the vehicles involved in the accident were evaluated according to their types, it was determined that 88 (64%) of the traffic accidents occurred with automobiles. According to Turkish Statistical Institute 2023 data, automobiles rank first in the number of vehicles most frequently involved in accidents involving death and injury and the number of drivers killed. It has been reported that among the vehicle types involved in traffic accidents throughout Türkiye, cars take the first place and motorcycles come second [5]. In our study, it was determined that 72 (52%) of the victims were inside the vehicle at the time of the accident, and 66 (48%) were outside the vehicle. In a study conducted in Istanbul where traffic accidents were evaluated, it was reported that in-car traffic accidents were 51.4%, extra-vehicular traffic accidents were 29.5%, and motorcycle accidents were 16.6% [13]. In our study, it was determined that out of 138 deaths due to traffic accidents, 56 were drivers, 52 were passengers and 30 were pedestrians. 21.7% of all fatalities were pedestrians, and when the vehicles that hit pedestrians were evaluated, it was determined that 21 of them were hit by cars, 4 by trucks or trucks, and 4 by motorcycles. It was observed that 40.5% of all fatalities were caused by drivers, and 35 of the dead drivers were car drivers. It was seen that tractor drivers and motorcycle drivers were following them, respectively.

The body part that is most damaged and causes death in traffic accidents is the skull [14]. In our study, the cause of death was found to be head trauma in 69 cases, internal organ damage and internal bleeding in 29 cases, and medulla spinalis injury in 2 cases. It is known that head and neck injuries are most common in cases of unnatural death [15]. When our study is evaluated in terms of trauma areas, head and neck trauma is the most common with 91 cases (65.9%), in line with the literature, and when the cases with head and neck trauma are evaluated as drivers and pedestrians; It was observed that a total of 35 (62.5%) cases, 12 of which were isolated head and neck injuries among the drivers, and 25 (83.3%) of the pedestrians, had head-neck trauma. In a study conducted in Edirne, it was reported that the head and neck were most frequently injured in in-vehicle traffic accidents (29%), and the extremities were most frequently injured in out-

of-vehicle traffic accidents (38%) [16]. In the evaluation of bone fractures detected in our study; It was observed that there were bone fractures in the craniofacial bones in 54% of the cases, in the ribs and sternum in 46%, in the extremities in 10%, in the vertebrae in 9%, in the pelvis in 6%, and in 7% there were no bone fractures. In a study conducted in Diyarbakır, it was reported that the most common fracture was skull fracture with 49%, and in a study conducted in Istanbul, it was reported that the most common fracture was skull fracture with 59% [7,17].

## CONCLUSION

As a result, traffic accidents occurring it has a very important place among traumatic deaths all over the world. Evaluating the statistical data presented on traffic accidents and understanding the seriousness of the situation is important for. In order to minimize death and disability due to traffic accidents, necessary precautions should be taken, inspections should be carried out and traffic rules should be obeyed by the society.

### Conflict of Interests

*The authors declare that there is no conflict of interest in the study.*

### Financial Disclosure

*The authors declare that they have received no financial support for the study.*

### Ethical Approval

*Ethics committee approval was obtained with the decision numbered 24-KAEK-231 by Tokat Gaziosmanpaşa University Faculty of Medicine Clinical Research Ethics Committee.*

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Original Article

**Evaluation of forensic cases under the age of 18 reported  
at İnönü University Turgut Özal Medical Center forensic medicine polyclinic**

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**Abstract**

**Aim:** The aim of our study was to reveal the sociodemographic characteristics of children presenting with forensic cases, determine the types of trauma they were exposed to based on age groups and sex, identify key factors to consider in forensic medical evaluations, and develop recommendations for child protection.

**Materials and Methods:** Between September 2008 and May 2021, 132 cases under the age of 18 for whom forensic reports were prepared at the Department of Forensic Medicine at İnönü University were retrospectively analyzed in terms of age, sex, reason for the report request, requesting units, date of the incident, location of the trauma, injuries sustained, and report results.

**Results:** Among the cases, 91 (68.9%) were male and 41 (31.1%) were female. The highest number of reports were requested for the 0-6 age group (43.2%). The majority of report requests (64.4%) were made by judicial law enforcement units. The incidents occurred most frequently in July (13.6%) and during the summer season (31.8%). The most common causes of injury were traffic accidents (37.1%), followed by assault (15.9%) and falls (15.9%). In the 15-17 age group, assault incidents (33.3%) were the most common, while traffic accidents were the most frequent in other age groups. Injuries to the head, neck, and face accounted for 36.1% of the total injuries. It was determined that 62 cases involved bone fractures, 45.5% of which had moderate to severe effects on vital functions.

**Conclusion:** To support the healthy development of children, it is crucial to identify all adverse factors, undertake efforts to prevent these factors, and implement effective rehabilitation measures. In this context, forensic evaluations can offer significant opportunities for safeguarding children. Families, educational institutions, and governments hold important responsibilities in ensuring the healthy upbringing of children and reducing their exposure to judicial cases, trauma, and acts of violence.

**Keywords:** Forensic medicine, forensic reports, children, traffic accident, assault

**INTRODUCTION**

A substantial number of cases presenting to emergency services have a forensic nature and are evaluated through medical and legal assessments in forensic medicine clinics. These forensic cases span all age groups. However, children are more frequently exposed to trauma that may result in forensic cases due to factors such as their mobility, underdeveloped self-defense mechanisms, and the failure of adults to adequately fulfill their duties of supervision and protection. According to Article 1 of the Convention on the Rights of the Child, which gained international status on September

2, 1990, and was adopted in our country on January 27, 1995, following its publication in the Official Gazette, every individual under the age of 18 is considered a child unless they reach legal maturity at an earlier age under national laws [1]. The guardian responsible for a child is legally obligated to protect them from external harm and ensure their physical safety. As stated in the Convention on the Rights of the Child, the state is also responsible for protecting children from any form of physical or emotional abuse inflicted by caregivers, including parents. Additionally, the state must implement social programs aimed at preventing child

**CITATION**

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abuse, treating children exposed to such harm, and safeguarding their right to live and develop [2]. Globally, children are frequently subjected to trauma such as traffic accidents, falls from heights, physical assault, firearm injuries, stab wounds, poisoning, electrocution, lightning strikes, asphyxia, burns, as well as physical and verbal abuse. Such incidents have underscored the need for protective laws worldwide. However, despite these legal and protective measures, the number of forensic cases involving children remains alarmingly high [3].

Most physical traumas recognized as forensic incidents during childhood are preventable if appropriate precautions and interventions are taken. This study aims to evaluate the forensic cases involving children referred to the Forensic Medicine Clinic of İnönü University Turgut Ozal Medical Center. By analyzing the sociodemographic characteristics of these cases, identifying the types of trauma based on age groups and sex, and emphasizing key considerations for forensic medical evaluations, we hope to raise awareness about these preventable traumas. Ultimately, our goal is to propose new strategies to better protect children and reduce the occurrence of such cases.

## MATERIAL AND METHOD

Cases involving individuals under the age of 18, for whom a forensic report was issued and registered at the İnönü University Department of Forensic Medicine between September 2008 and May 2021, were retrospectively evaluated in terms of age, sex, the type of incident for which the report was requested, the units that requested, the date of the incident, the services consulted, trauma locations, resulting injuries, and the outcomes of the reports. The 22nd version of the Statistical Package for the Social Sciences (SPSS) software was used for the statistical analysis of the study. As a result of the statistical analysis, descriptive statistics were presented as frequencies and percentages. Ethics committee approval for our study was obtained from the İnönü University Health Sciences Non-Interventional Clinical Research Ethics Committee with the decision numbered 2024/6916.

## RESULTS

In our study, 132 cases referred to the Forensic Medicine Polyclinic between September 2008 and May 2021 were evaluated. Of the 132 cases examined, 68.9% (91) were male, and 31.1% (41) were female.

The average age of the examined cases was  $8.4 \pm 5$  years, with a minimum age of 0 and a maximum age of 17. The ages of the cases were divided into four groups 0-6, 7-11, 12-14, and 15-17 according to school entry readiness and the development of behavioral self-regulation abilities. The largest group (43.2%) among the cases referred to the forensic medicine polyclinic was the 0-6 age group, followed by the 15-17 age group with 25%. The distribution of age groups by sex is presented in Table 1.

The highest frequency of incidents requiring forensic reports among pediatric cases occurred in July (13.8%), followed by June (11.4%) and September (11.4%). Seasonally, the majority of forensic reports were issued during the summer, accounting for 42 cases (31.8%). The distribution of incident types across seasons

and months is presented in Table 2.

Regarding the authorities requesting forensic reports, 64.4% (n=85) of the reports were requested by judicial law enforcement units, while 35.6% were requested by courts and prosecutor's offices.

Upon examining the types of incidents for which forensic reports were requested, the most common was traffic accidents (37.1%), followed by assault (corporal punishment) (15.9%) and falls (15.9%). In terms of the duration of trauma exposure by sex, 32% of the traumas experienced by males were traffic accidents, followed by 22% due to physical assaults. For females, 48.8% of the total traumas were traffic accidents, followed by 19.5% due to falls from heights. The distribution of incident types by sex is shown in Table 3.

In terms of event types according to the age distribution of the cases, traffic accidents are the most common in child forensic cases aged 0-14 presented to the forensic medicine clinic. In the 15-17 age group, physical assaults are the most prevalent. In the 0-6 age group, falls from heights (28.1%) are the second most common incident, followed by assault (15.4%) in the 7-11 age group and assault and electric shock (18.8%) in the 12-14 age group. In the 15-17 age group, traffic accidents (27.3%) rank second. The distribution of event types by age group is shown in Table 4.

When the distribution of cases according to the injured body parts was examined, it was found that the most commonly injured areas were the head and neck (22.7%), followed by the face (13.4%). The distribution of cases by injured body part is shown in Table 5.

It was determined that 80.3% of the injuries in the cases were not mild enough to be treated with simple medical intervention, and 53% were life-threatening. Regarding permanent facial scars, a report indicated that 106 cases (80.3%) did not have permanent facial scars, 20 cases (15.2%) required re-evaluation after 6 months to assess whether the injury resulted in permanent facial scars, and 6 cases (4.5%) had permanent facial scars. A report also stated that 50% of the cases did not lead to permanent impairment or loss of function in any of the senses or organs. Bone fractures were observed in 62 cases (47%), with fractures in 2 of these cases having mild effects on vital functions, 24 cases being of moderate severity, and 36 cases being severe. The status of the cases according to their severity is shown in Table 6.

**Table 1.** Distribution of age groups by sex

Age group	Female	Male	Total
<b>0-6 (n)</b>	40	17	57
<b>%</b>	44	41.5	43.2
<b>7-11 (n)</b>	16	10	26
<b>%</b>	17.6	24.4	19.7
<b>12-14 (n)</b>	10	6	16
<b>%</b>	11	14.6	12.1
<b>15-17 (n)</b>	25	8	33
<b>%</b>	27.5	19.5	25
<b>Total (n)</b>	91	41	132

**Table 2.** Distribution of cases by month and season

Month	n	%	Season	n	%
December	10	7.6	Winter	28	21.2
January	10	7.6			
February	7	5.3			
March	7	5.3	Spring	26	19.7
April	10	7.6			
May	11	8.3			
June	15	11.4	Summer	42	31.8
July	18	13.6			
August	9	6.8			
September	15	11.4	Autumn	36	27.3
October	10	7.6			
November	10	7.6			
<b>Total</b>	<b>132</b>	<b>100</b>	<b>90</b>	<b>132</b>	<b>100</b>

**Table 3.** Current status of event types in cases according to sex

Sex	Traffic accident	Physical assault	Penetrating and sharp-force injuries	Burns	Gunshot wound	Falls from heights	Electrocution	The other one*	Total
<b>Male (n)</b>	29	20	4	5	7	13	5	8	91
<b>%</b>	32	22	4	6	8	14	6	9	100
<b>Female (n)</b>	20	1	2	4	4	8	1	1	41
<b>%</b>	48.8	2.4	4.9	9.8	9.8	19.5	2.4	2.4	100
<b>Total (n)</b>	49	21	6	9	11	21	6	9	132
<b>%</b>	37.1	15.9	4.5	6.8	8.3	15.9	4.5	6.8	100

\*Door crush injury, drowning, hand caught in machinery, needle insertion, childbirth

**Table 4.** Occurrence of types of events in the events according to age

Age group	Traffic accident	Physical assault	Penetrating and sharp-force injuries	Burns	Gunshot wound	Falls from heights	Electrocution	The other one*	Total
<b>0-6 (n)</b>	18	3	3	8	2	16	0	7	57
<b>%</b>	31.6	5.3	5.3	14	3.5	28.1	0	12.3	100
<b>7-11 (n)</b>	15	4	1	0	3	1	0	2	26
<b>%</b>	57.7	15.4	3.8	0	11.5	3.8	0	7.7	100
<b>12-14 (n)</b>	7	3	0	0	1	2	3	0	16
<b>%</b>	43.8	18.8	0	0	6.3	12.5	18.8	0	100
<b>15-17 (n)</b>	9	11	2	1	5	2	3	0	33
<b>%</b>	27.3	33.3	6.1	3	15.2	6.1	9.1	0	100
<b>Total (n)</b>	49	21	6	9	11	21	6	9	132
<b>%</b>	37.1	15.9	4.5	6.8	8.3	15.9	4.5	6.8	100

\*Door crush injury, drowning, hand caught in machinery, needle insertion, childbirth

**Table 5.** Distribution of cases according to injured body parts

<b>Injured Body Part</b>	<b>n</b>	<b>%</b>
Head	45	18.2
Thorax	23	9.3
Abdomen	20	8.1
Neck	11	4.5
Hip	10	4
Foot	5	2
Forearm	18	7.3
Arm	22	8.9
Hand	8	3.2
Back	11	4.5
Thigh	12	4.9
Shoulder	8	3.2
Leg	14	5.7
Face	33	13.4
Finger	6	2.4
Toe	1	0.4
<b>Total</b>	<b>237</b>	<b>100</b>

**Table 6.** Distribution of cases according to injury severity

<b>Of a nature that can be remedied with simple medical intervention</b>	<b>n</b>	<b>%</b>
Mild	26	19.7
Not mild	106	80.3
<b>Life-threatening</b>		
Yes	70	53
No	62	47
<b>Permanent facial scars</b>		
Yes	6	4.5
No	106	80.3
Will be evaluated after 6 months	20	15.2
<b>Permanent impairment or loss of function in any of the senses or organs</b>		
No	66	50
The weakening of the organ's function,	1	0.8
Inability of the organ to perform its function	6	4.5
The disease that cannot be cured	1	0.8
Will be evaluated after recovery	14	10.6
Will be evaluated after 12 months	5	3.8
Will be evaluated after 18 months	39	29.5
<b>Bone fractures</b>		
Mild severity	2	1.5
Moderate severity	24	18.2
Severe severity	36	27.3
No	70	53

## DISCUSSION

Children may experience various forensic events that impact their health from bio-psycho-social perspectives, such as traffic accidents, falls, assault (corporal punishment), all forms of abuse and neglect, burns, gunshot wounds, and sharp object injuries. Some of these events are not reported to any healthcare institution for various reasons, and some that are reported are not evaluated as forensic cases. In this study, cases referred to the Forensic Medicine Polyclinic for the purpose of preparing a forensic report and evaluated as forensic cases over a 12-year period were assessed.

Of the child cases for which a forensic report was prepared at the Forensic Medicine Polyclinic, 91 (68.9%) were male and 41 (31.1%) were female. When reviewing similar studies on the topic, it is observed that the male-to-female ratio in these studies ranges between 76.8% and 51.8%, which aligns with our findings [4-8]. This situation is believed to be related to cultural sex discrimination, with girls being more excluded from social activities than boys. Boys also tend to spend more time outside the home, engage in traffic-related activities, exhibit more risky behaviors, and are less supervised by parents compared to girls.

When the age distribution was evaluated within the pediatric cases, it was found that the largest group was the 0-6 age group, accounting for 43.2%. A review of similar studies revealed that our findings were consistent with other studies, including Bursal Durmaz et al. (2015) with a rate of 52.72%, and Demirdöken et al. (2023) with a rate of 69.9% [5,9-12]. However, when reviewing the literature, it was found that in several studies, the 15-17 age group constituted the majority: Karaaslan et al. (2012) 38.9%, Ersoy et al. (2020) 36.6%, Hüsrevoğlu and Doğan (2021) 37.94%, Sertdemir et al. (2020) (though not numerically stated, this range was mentioned as the most common among adolescents), and Yazıcı and Can (2019) 59.3% [4,6,13-15]. These studies are thought to have focused primarily on poisoning and suicide, which could explain the differences in the predominant age groups. Another reason for the discrepancy may be the differences in research centers and study designs.

In 64.4% of the cases, a report was requested by judicial law enforcement units. Similarly, in the study conducted by Ersoy et al. (2020) evaluating the reports received by the forensic medicine polyclinic, the rate of report requests from judicial law enforcement units was higher [6]. In a study conducted in Erzurum, where requests for forensic reports received by the Forensic Medicine Branch Directorate were evaluated, it was reported that 91.6% of these requests came from the Chief Public Prosecutor's Office [16]. The lower demand from judicial bodies in our study was attributed to the fact that judicial units typically obtain reports through judicial law enforcement units, and forensic medicine polyclinics in hospitals are not integrated into the National Judiciary Informatics System.

Numerous studies have shown that forensic cases are most frequently observed during the summer season [5,7,17,18]. Similar findings were observed in our study. The closure of

schools during the summer and early autumn months, along with increased time spent outdoors due to the season, result in a larger area of movement, greater participation in social activities, and more communication in the external environment, which help explain the rise in accidents and other injuries. Furthermore, the increased workload and the nature of human interactions during the hot season contribute to the higher incidence of forensic cases, particularly traffic accidents and assaults.

Among the pediatric cases referred to the forensic medicine clinic, the largest group (37.1%) consists of traffic accidents. This finding is consistent with studies in the literature, where traffic accidents are the most common cause, with rates of 62.9% and 30.8% [6,7,17-20]. Generally, the majority of cases referred for evaluation, due to traffic accidents and assaults, are male, which aligns with the existing literature [9-11,20]. It is believed that this outcome may be related to the fact that boys spend more time outside the home and in traffic, and are more prone to risky behaviors due to sex norms and roles they are socialized into. The fact that traffic accidents are the most common among forensic cases highlights that traffic-related injuries and accidents remain a significant issue in our country.

When examining the age groups in relation to the types of incidents, assault incidents (33.3%) rank first in the 15-17 age group, followed by traffic accidents (27.3%). In the other age groups, traffic accidents are the most common, with the 0-6 age group showing nearly equal rates of traffic accidents and falls from heights. Similar results were reported in other studies when evaluating incident types by age range [4,6,8,18]. This can be attributed to the fact that during infancy and early childhood, children's self-protection mechanisms, such as muscle development, skeletal strength, and reflexes, are not yet sufficiently developed. Additionally, parents may not be able to fully meet their protective responsibilities. In the 15-17 age group (middle adolescence), adolescents are more prone to engaging in violent behavior.

Although injuries within the boundaries of the face were evaluated as aggravated injuries and analyzed separately, injuries affecting the head, neck, and face region account for 36.1% of the total injuries. Korkmaz et al. (2014) found the head-neck region to be the most frequently injured, with a rate of 30.1%, while Çınar et al. (2010) reported a rate of 28%, which supports the findings of our study. We believe that, particularly in the pediatric age group, the head occupies a larger proportion of the body, and the underdevelopment of self-protection mechanisms such as muscles, reflexes, and especially neck muscles increases the incidence of head, neck, and facial injuries.

It was determined that 62 of the cases had bone fractures, with 45.5% of them having moderate to severe effects on vital functions. The fact that nearly half of the cases with bone fractures had moderate to severe impacts on vital functions, and that approximately 53% of the cases presented a life-threatening risk, indicates the severity of the trauma. Our findings align with those of other studies [6,7,17,21].



## CONCLUSION

It is meaningful that the majority of pediatric forensic cases result from traffic accidents, falls, and assaults, as these injuries are preventable. To reduce traffic accidents with injuries, it is believed that certain protective measures are required, such as increasing the number of school buses, expanding safe playgrounds and parks, and implementing necessary traffic regulations and inspections. Furthermore, social awareness campaigns should be conducted, and programs aimed at preventing communication and interpersonal violence, particularly for adolescents, should be developed. Given that sex discrimination starts in childhood, awareness training on sex equality should be provided to both children and adults. It is also believed that safety measures for doors and windows in environments where children are present, to prevent falls from heights, should be made a legal requirement, with priority given to educating parents on this issue. Regardless of the cause, these traumatized children pose a significant risk of abuse. In this regard, forensic examinations and notifications should be carried out, and these children should be monitored by relevant institutions under the Child Protection Law, regulated by Law No. 5395. Families, educational institutions, and governments have important responsibilities in ensuring that children grow up healthy and minimizing their involvement in criminal cases, trauma, and violence.

### Conflict of Interests

*The authors declare that there is no conflict of interest in the study.*

### Financial Disclosure

*The authors declare that they have received no financial support for the study.*

### Ethical Approval

*Ethics committee approval for our study was obtained from the İnönü University Health Sciences Non-Interventional Clinical Research Ethics Committee with the decision numbered 2024/6916.*

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Original Article

## Evaluation of female forensic cases reported due to assault in the forensic medicine polyclinic in 2023

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### Abstract

**Aim:** One of the most common case groups encountered in health institutions is forensic cases. In acts of assault, which is one of the judicial cases, the way the act occurs, the progress process and the effect on the person as a result of the incident vary depending on sex. In our study, it is aimed to determine the characteristics of female forensic cases referred to us due to assault in 2023, such as their age, the type of action, the clinical result of the victim as a result of the to determine the causes and consequences of the assault and to reveal the precautions to be taken.

**Materials and Methods:** Female judicial applications referred to our department due to assault action within a 1-year period between 01.01.2023 and 31.12.2023 were included in the study. 29 final reports, court files and forensic examination documents were retrospectively reviewed. Information such as the season in which the incident occurred, age, type of action, clinical outcome, and localization of the injury on the body were classified and coded into the SPSS 27.0 program and analyzed. Descriptive statistics and frequency tables of the data were created and compared.

**Results:** When the cases were divided into age groups; it was seen that 96.6% were between the ages of 18-65, 82.8% of the cases were referred due to assault, the most common perpetrators of the assaults were the husband of the victim (20.7%).

**Conclusion:** In order to prevent the assault from taking place, both women and men should be educated from a young age, both through the education curriculum and communication channels. The paths to be followed after the assault has taken place should be communicated to every woman in a clear and understandable manner.

**Keywords:** Forensic medicine, woman, assault

### INTRODUCTION

One of the most common case groups encountered in health institutions is forensic cases. Any unnatural case is evaluated as a forensic case. A forensic phenomenon is a person experiencing health problems due to an environmental effect. Preparing a forensic report is a task that both therapeutic and preventive medicine perform together [1]. Article 280 of the Turkish Penal Code (TPC) states that "A health professional who, despite encountering an indication that a crime has been committed while performing his duty, fails to report the situation to the competent authorities or delays in doing so shall be punished

with imprisonment of up to one year" [2]. In this regard, the physician must also evaluate each patient who examined from a forensic perspective.

Differences arising from gender affect every area of social life, as well as the way in which legal events occur, the process of progress and the impact on the person as a result of the event. For example; while work accident cases are more common in men, suicide cases due to drug intake are more common in women. [3]. In assaults, the way the verb occurs, the progress process and the effect on the person as a result of the event change depending on the sex [4].

### CITATION

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The most common type of injury in our country, regardless of gender, is traffic accidents [3-6]. After traffic accidents, assaults, falls from heights, gunshot wounds, sharp object wounds, burns and electric shocks, animal injuries, suspected abuse cases and suicide cases are also frequently seen. [4,7].

The act of assault often appears as physical violence, gunshot wounds or stab wounds. World Health Organization (WHO) data show that nearly 1 in 3 (30%) of women worldwide have experienced violence, whether physical, sexual or both, in their lifetime [8]. Women mostly encounter violence for the first time through their family, friends and social environment [9]. The most common murder weapon used in femicides is firearms [10]. Assault is defined in Article 86 of the TPC as "intentionally causing pain to another person's body or causing their health or perception to deteriorate" [2].

In our study, it is aimed to determine the characteristics of female forensic cases referred to us due to assault in 2023, such as their age, the season in which the incident occurred, the type of action, the clinical result of the victim as a result of the incident and the localization of the injury on the body, to determine the causes and consequences of the assault and to reveal the precautions to be taken.

**MATERIAL AND METHOD**

With the permission of the "İnönü University Health Sciences Non-Interventional Clinical Research Ethics Committee" decision number 2024/6910, female forensic cases who admitted to "İnönü University Faculty of Medicine, Department of Forensic Medicine" due to assault within a 1-year period between 01.01.2023 and 31.12.2023 were included in the study. Assault types were evaluated as physical violence, gunshot wounds and stabbing injuries. If a case is in the category of both physical violence and gunshot wounds, both types of injuries are included in separate tables. 29 final reports, court files and forensic examination documents were retrospectively reviewed. Files for which a report had been previously prepared but for which a new report had been requested by the judicial authorities, files for which a new report had been prepared after additional documents had been obtained, and files for patients whose files had been submitted to us but who had not come for examination, or for whom there had been problems in obtaining missing documents even if they had been examined, were excluded from the scope. In order to evaluate the different effects of traumas on individuals and the correlation of the degree of these effects with age, the age range of 1-18 for children, 18-65 for adults, and 65 and above for the elderly, based on the data of the Turkish Statistical Institute, was used [11-13]. While examining the marital status of the victims, their marital status on the date of the incident was compared with their marital status on the date of the research. The possibility of a second marriage was considered a limitation of our study. Information such as the season in which the incident occurred, age, type of action, clinical outcome, localization of the injury on the body, and marital status of the person were classified and coded into the SPSS 27.0 program and analyzed. descriptive statistics and frequency tables of the data were created and compared.

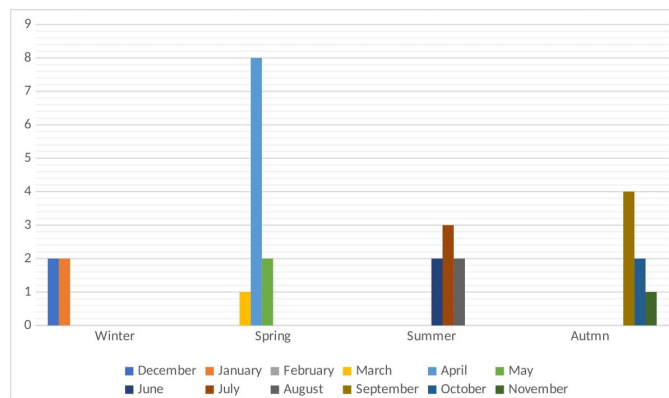
**RESULTS**

It was determined that the youngest age of the 29 female cases in the study was 13 years old, the oldest age was 64 years old, the average age was 36.76 years old, and the standard deviation was 14.21. When the cases were divided into age groups, it was seen that 3.4% were under the age of 18, 96.6% were between the ages of 18-65, and there were no cases referred to us due to assault over the age of 65 (Table 1).

**Table 1.** Age groups

	Count (n)	Percent (%)
<b>18&lt;</b>	1	3.4
<b>18-65</b>	28	96.6
<b>Total</b>	29	100.0

It was determined that the most cases referred to us due to assault (27.6%) occurred in april, and no female gender cases were referred to us due to assault in february (Figure 1). When seasonal assessment was made, it was seen that the most applications were made in the spring season due to assault (Figure 1).



**Figure 1.** Season-month

It was understood that 82.8% of the cases were referred due to physical violence, 6.9% were referred due to firearm injuries, and 3.4% were referred due to sharp object injuries and burns (Table 2).

**Table 2.** Type of assault

	Count (n)	Percent (%)
<b>Phsiycal violence</b>	24	82.8
<b>Firearm injuries</b>	2	6.9
<b>Sharp object injuries</b>	1	3.4
<b>Burns</b>	1	3.4
<b>No data</b>	1	3.4
<b>Total</b>	29	100.0

When the anamnesis and statements of the female cases referred to us due to assault were examined, it was seen that the most frequently identified perpetrators of effective action were the victim's husband (20.7%), and the identified perpetrators were largely close male relatives (Table 3).

**Table 3.** Perpetrator

	Count (n)	Percent (%)
<b>Father</b>	1	3.4
<b>Husband</b>	6	20.7
<b>Fiance</b>	1	3.4
<b>Son</b>	1	3.4
<b>Brother/Sister</b>	1	3.4
<b>Stranger</b>	1	3.4
<b>Friend</b>	1	3.4
<b>Mother</b>	1	3.4
<b>Unknown</b>	16	55.2
<b>Total</b>	29	100.0

**Table 5.** Report result

		Simple medical intervention		Total	
		Sufficient	Insufficient		
<b>Life-threatening</b>	<b>Exist</b>	Count (n)	0	1	
		Percent of total (%)	0.0	3.4	
	<b>Absent</b>	Count (n)	24	4	28
		Percent of total (%)	82.8	13.8	96.6
<b>Total</b>	Count (n)	24	5	29	
	Percent of total (%)	82.8	17.2	100.0	

## DISCUSSION

In our country, according to a study conducted by the General Directorate of the Status of Women in 2014, the rate of women who stated that they had been subjected to physical violence at some point in their lives was 39% in 2008, 36% in 2014, and 8% in the last 12 months. In other words, approximately four out of every 10 women are subjected to physical violence by their husbands or intimate partners [14-17]. In a study conducted in 2016, Büyükyılmaz et al. determined that 1627 of 2071 women who were subjected to violence were between the ages of 26-59 and 444 were 25 years old and under [18]. In a study conducted in Adana province in 2019, Yavuz et al. found that the average age of female forensic cases was 35.9, 74.7% of them were exposed to blunt trauma by someone else, 1.7% were exposed to cutting-piercing tool injuries, 1.1% were exposed to firearm injuries, and the perpetrator of 70.5% of the cases was the victim's husband, followed by her son, father, older brother, and younger brother, respectively [19]. In a study conducted in Manisa province in 2021, Karabağ et al. found that in cases of effective acts against women, the perpetrator was most often the spouse, fiancée or lover of the victimized woman with 47.2%, that these incidents usually occurred in the homes of the victims, and that in effective acts, women were more likely to be exposed to blunt trauma rather than firearms and sharp-edged tools, which are more likely to pose a threat to life [20]. In our study, it was determined that

When the current marital status of the women referred to us for assault was examined, it was seen that 48.3% were currently married, 31% were single, and 6% were married at the time of the incident but are currently divorced (Table 4).

**Table 4.** Marital status

	Count (n)	Percent (%)
<b>Married</b>	14	48.3
<b>Single</b>	9	31.0
<b>Divorced</b>	6	20.7
<b>Total</b>	29	100.0

It was observed that 82.8% of the female cases referred to us for assault had simple injuries, while 3.4% had life-threatening injuries (Table 5).

the average age was 36.76, that the most common application was made due to physical violence among the assaults, and that applications were made after sharp object injuries and firearm injuries at low rates. We believe that the reason for this situation is that women who are victims of violent acts are more likely to be exposed to spousal or partner violence, that there are differences between the society's perspective on violence and other types of injury among violent acts, and that socio-cultural factors are effective in the type of action the perpetrator will take.

Ersöz's 2011 study found that domestic violence and divorce rates were correlated [21]. According to the 2023 data of the Turkish Statistical Institute, the number of divorces per 1000 population [crude divorce rate] is 2,01 [22]. In our study, it was determined that 6 of the 29 women who were exposed to the assault act were divorced. We believe that this situation is consistent with the study conducted by Ersöz and that violence and divorce rates are related.

In a study conducted in Manisa in 2019, Aykır found that 1.8% of female forensic cases applying for assault were in mortal danger, 78.1% were not in mortal danger, 58% had injuries that could be resolved with simple medical intervention, and 10.1% had injuries that could not be resolved with simple medical intervention [4]. In our study, it was determined that 3.4% of the women who applied for assault were in mortal danger and 82.8% of their injuries could be resolved with simple medical

intervention. Yavuz et al. found that 5.8% of women exposed to physical violence had bone fractures, 2.8% had life-threatening injuries, 87.6% had minor injuries, and 6.4% had injuries that were not minor [19] The results are similar. We believe that the reason for this situation is that the most common application is for physical violence among the assaults, the act of physical violence is most often applied to female victims by their partners, and the act of physical violence is used as a punishment method with socio-cultural effects.

## CONCLUSION

Assault against women constitutes a significant portion of violence against women, which is a significant public health problem. While there are assault acts that are recorded upon application to official institutions, there are also assault acts that are not recorded and have not been applied to official authorities due to socio-economic and cultural effects. Assaults towards women are usually performed by men in the woman's close circle. In order to prevent the action from taking place, both women and men should be educated from a young age, both through the education curriculum and communication channels. The paths to be followed after the action has taken place should be communicated to every woman in a clear and understandable manner. In order to eliminate the socio-economic and cultural effects that prevent making official applications and to purify women individuals from elements of fear, the number of official or private civil society organizations such as the 183 family, women, children and disabled social service hotlines, violence prevention and monitoring centers, provincial social services directorates, women's counseling centers, women's shelters, which are currently active, should be increased, these services should be brought to even the smallest settlements and their functioning methods should be explained.

Health institutions are usually the first point of contact for assaults against women. Health workers should be given repetitive training on the issues of recognizing the event, the sensitivity to be shown in diagnosis and treatment, and the process to be carried out after treatment, and the care to keep records and report for the soundness of the judicial process.

Assault actions against women are carried out in a wide range. In solving this problem, every criterion should be examined in detail, short-term and long-term plans should be put forward, and all authorized institutions related to law, health, education and family should be in communication and act together.

### Conflict of Interests

*The authors declare that there is no conflict of interest in the study.*

### Financial Disclosure

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### Ethical Approval

*İnönü University Health Sciences Non-Interventional Clinical Research Ethics Committee decision number 2024/6910.*

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Original Article

## Forensic identification of severely decomposed bodies

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### Abstract

**Aim:** The decay of a body is defined as decomposition in the field of forensic medicine. In this study, it is aimed to examine the sociodemographic data in severely decomposed bodies and identify the biological materials that can be collected for identification.

**Materials and Methods:** In this study, the files of cases autopsied at the Forensic Medicine Institute in Şanlıurfa between 2018-2022 were retrospectively analyzed. Severely decomposed cases were identified.

**Results:** Of the cases, 18 were male and 3 were female. 11 cases occurred in summer, and 4 in spring. 10 of the cases were suspicious deaths found at home or in the field while 8 were bodies recovered from water. Blood samples could only be taken from 9 cases for identification procedures. Muscle tissue samples were taken from 12 cases, bone tissue from 18 cases, and 2 cases each had dental and hairy skin samples collected. The psoas muscle was selected as the muscle tissue, while sternum samples were collected from 15 cases and femur samples from 3 cases.

**Conclusion:** Identification in cases of severe decomposition is as important as determining the cause of death. In situations where medical identification can't be performed, forensic identification becomes extremely significant. The biological samples to be taken in forensic identification, the number and quality of these samples, and the preservation of these samples for Deoxyribonucleic Acid (DNA) analysis are important considerations.

**Keywords:** Identification, deoxyribonucleic acid, autopsy, decomposition

### INTRODUCTION

The breakdown of complex and advanced organic compounds into simpler elements occurs through the action of proteolytic and other enzymes produced by bacteria. This process results in the tissues breaking down into gases, liquids, and salts, thus disappearing. Biological entities must decay after death to re-enter the ecological system [1,2]. After a person's death, early and late signs of death manifest. Decomposition is an inevitable consequence following cellular autolysis [1-3].

Decomposition traditionally consists of four stages:

**Stage 1:** Generally begins 36-48 hours after death, marked by a green discoloration about the size of a palm on the right side of the

abdomen. Hydrogen sulfide formed combines with hemoglobin separated from the blood to create sulfohemoglobin. The initial sign in the abdomen gradually expands and spreads throughout the body. The visibility of vessels on the body's surface is referred to as the decomposition map, while the movement of fluids within blood vessels is called postmortem circulation. Gases collected in the abdomen bloat the body, causing blood-tinged frothy fluid to emerge from the mouth and nose, referred to as postmortem circulation. The epidermis begins to peel in layers, and internal organs start to decay. Fluid accumulates in the pleura. The order of organ decay is the trachea, stomach, intestines, spleen, liver, brain, heart, lungs, kidneys, bladder, esophagus, pancreas, diaphragm, and bronchi. Among soft organs, the uterus remains

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intact during decomposition. This stage is typically completed within three weeks.

**Stage 2:** This stage begins with the bursting of the abdomen, which can be quite loud. Once the abdomen ruptures, the abdomen and thorax collapse, and the lungs shrink. The liver softens, while the uterus remains in place. The sex of the individual becomes externally identifiable.

**Stage 3:** In this stage, the liver is lost, and the skeleton begins to become visible.

**Stage 4:** This stage begins when the sex can no longer be determined upon external examination, and the skeleton is broadly exposed. Bones, hair, and teeth remain for long periods without decomposing. Generally, it takes about five years for a buried body to decompose entirely into a skeletal state [1-5].

Although the progression of decomposition usually occurs this way, the rate can differ between various regions of the same body. Additionally, exceptional circumstances such as mummification and adipocere formation can also result from decomposition [4,6]. Changes due to decomposition can lead to misinterpretations during autopsies, particularly in advanced stages where most injuries may be obscured. This may also present challenges during the identification process [7,8].

This study aims to examine the sociodemographic data in severely decomposed bodies and to identify the biological materials that can be collected for identification.

## MATERIAL AND METHOD

In our study, the files of cases autopsied at the Forensic Medicine Institute in Şanlıurfa from 2018 to 2022 were analyzed retrospectively. Severely decomposed cases were identified. Relevant documents such as autopsy reports, autopsy photographs, toxicological examination reports, crime scene investigation reports, witness statements, expert reports, and biological samples taken for Deoxyribonucleic Acid (DNA) analysis for forensic identification were reviewed.

Ethics committee approval was obtained with the decision numbered 21589509-2023/414 of The Council of Forensic Medicine dated 10/05/2023.

## RESULTS

Thirteen of the cases were of Turkish nationality, while eight were Syrian. Eighteen cases were male, and three were female. Due to the inability to determine the age of the individuals through external examination, no age information could be provided. Analyzing the yearly distribution, there were no severely decomposed bodies reported in 2018 and 2019. However, two cases occurred in 2020, ten in 2021, and nine in 2022. Eleven cases occurred during the summer, four in the spring, five in the autumn, and one in the winter (Table 1). Ten cases were identified as suspicious deaths where the bodies were found at home or in a field. Eight were bodies recovered from water, two were exhumation cases, and one was found hanging (Table 1).

**Table 1.** Sociodemographic data of the cases

Case	Nationality	Sex	Month	Season	How the event happened
Case -1	Turkish	Female	9	Autumn	Exhumation
Case -2	Turkish	Male	10	Autumn	Hanging
Case -3	Syrian	Male	1	Winter	Home or in a field
Case -4	Syrian	Female	5	Spring	Home or in a field
Case -5	Turkish	Male	5	Spring	Recovered body from water
Case -6	Turkish	Male	5	Spring	Recovered body from water
Case -7	Syrian	Male	7	Summer	Recovered body from water
Case -8	Turkish	Male	7	Summer	Recovered body from water
Case -9	Turkish	Male	8	Summer	Recovered body from water
Case -10	Syrian	Male	8	Summer	Home or in a field
Case -11	Syrian	Male	8	Summer	Home or in a field
Case -12	Syrian	Male	9	Autumn	Recovered body from water
Case -13	Turkish	Male	5	Spring	Home or in a field
Case -14	Syrian	Male	6	Summer	Exhumation
Case -15	Turkish	Male	7	Summer	Home or in a field
Case -16	Turkish	Male	7	Summer	Home or in a field
Case -17	Syrian	Male	6	Summer	Home or in a field
Case -18	Turkish	Male	8	Summer	Home or in a field
Case -19	Turkish	Female	8	Summer	Recovered body from water
Case -20	Turkish	Male	9	Autumn	Home or in a field
Case -21	Turkish	Male	10	Autumn	Recovered body from water

For identification, blood samples could be obtained from only nine cases. Given the possibility of blood mixing with decomposition fluids in severely decomposed bodies, additional samples were collected in all cases to facilitate DNA comparison. Muscle tissue

was sampled in 12 cases, bone tissue in 18 cases, teeth in 2 cases, and hairy skin in 2 cases. The psoas muscle was selected as the muscle tissue sample, while the sternum was sampled in 15 cases and the femur in 3 cases as the bone tissue sample (Table 2).

**Table 2.** Samples taken for identification

Case	Blood	FTA	Muscle	Bone	Teeth	Hairy skin	Bone sample
Case -1	Negative	Negative	Positive	Positive	Negative	Negative	Sternum
Case -2	Positive	Positive	Positive	Positive	Negative	Negative	Sternum
Case -3	Negative	Negative	Positive	Positive	Negative	Negative	Sternum
Case -4	Negative	Negative	Negative	Positive	Negative	Positive	Femur
Case -5	Positive	Positive	Negative	Negative	Negative	Negative	-
Case -6	Positive	Positive	Negative	Positive	Negative	Negative	Sternum
Case -7	Positive	Positive	Positive	Positive	Negative	Negative	Sternum
Case -8	Positive	Positive	Negative	Positive	Negative	Negative	Sternum
Case -9	Negative	Negative	Positive	Positive	Negative	Negative	Sternum
Case -10	Negative	Negative	Positive	Positive	Negative	Negative	Sternum
Case -11	Negative	Negative	Negative	Positive	Negative	Negative	Femur
Case -12	Positive	Positive	Negative	Negative	Negative	Negative	-
Case -13	Negative	Negative	Positive	Positive	Negative	Negative	Sternum
Case -14	Negative	Negative	Negative	Positive	Positive	Negative	Sternum
Case -15	Negative	Negative	Positive	Positive	Negative	Negative	Sternum
Case -16	Positive	Positive	Negative	Negative	Negative	Negative	-
Case -17	Negative	Negative	Negative	Positive	Positive	Negative	Femur
Case -18	Positive	Positive	Positive	Positive	Negative	Negative	Sternum
Case -19	Negative	Negative	Positive	Positive	Negative	Negative	Sternum
Case -20	Negative	Negative	Positive	Positive	Negative	Positive	Sternum
Case -21	Positive	Positive	Positive	Positive	Negative	Negative	Sternum

External examination during the autopsy revealed significant decomposition findings. Internal examination showed that the brain had liquefied, the consistency of other internal organs had softened, and their structures had become fragile and deteriorated. The heart in all cases exhibited a sac-like structure. Toxicological analyses did not detect alcohol, narcotics, or stimulants; however pharmaceutical agents were identified. Histopathological examinations revealed autolysis findings in all organ samples collected. For the determination of the exact cause of death, all cases were referred to a higher committee for evaluation.

## DISCUSSION

In cases of severely decomposed bodies, investigative authorities frequently request opinions regarding identification, cause and manner of death, and the postmortem interval. Autopsies conducted on decomposed bodies are invariably more challenging compared to standard autopsies. Severe decomposition presents additional complications. Changes caused by decomposition, as well as alterations resulting from the activity of maggots, larvae, and insects, can complicate dissection and alter physical findings [9].

In our study a male predominance was observed, consistent with findings in similar studies [9-11]. This may be attributed to factors such as social isolation, poor health, financial difficulties, and insufficient family support. Studies also indicate that elderly individuals living alone are at a higher risk of being found helpless or deceased at home [12].

In this series, most decomposed bodies were found either in open areas or inside homes, with a subsequent proportion recovered from water. Similar to our findings, previous studies have also reported decomposed bodies being found in homes or recovered from water [10,11]. The delay in retrieving bodies from such isolated locations often leads to advanced stages of decomposition. Additionally, bodies submerged in water may not be immediately discovered despite intensive search efforts and might only be noticed once they float to the surface.

In our study, the majority of decomposed bodies were found during warmer seasons, particularly in the summer. This is consistent with the literature, which highlights the accelerating effect of high temperatures on decomposition, resulting in a higher frequency of cases during summer months [9,13,14].



Decomposition occurs more frequently and progresses faster in hot summer months, with cases being 2.3 times more common compared to winter.

Identification in severely decomposed or skeletonized bodies poses greater challenges compared to other cases. Decomposition significantly alters an individual's physical characteristics, making visual identification highly difficult and sometimes impossible [9]. Fingerprint analysis and dental comparisons are considered the most scientifically reliable methods for identification [15]. However, dental comparison is not applicable to every case in our country. Facial reconstruction and superimposition techniques also assist in identifying individuals in cases of skeletonized remains [4,16].

In this study, blood samples on FTA cards, teeth, muscle tissue, bone tissue, and hairy skin samples were collected for DNA comparison to aid in the identification of decomposed bodies. Currently, DNA analysis using bones and teeth is a widely employed method for identification in such cases [16].

## CONCLUSION

Identification of severely decomposed and skeletonized bodies is highly challenging. However, it can be achieved through DNA comparison using appropriate biological samples. Autopsies performed on decomposed bodies help exclude multiple possibilities, thus aiding in the interpretation of the cause of death.

### Conflict of Interests

*The authors declare that there is no conflict of interest in the study.*

### Financial Disclosure

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### Ethical Approval

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## Case Report

# Repeated maternal filicide: Importance of relationship between personality disorders and malingering in criminal responsibility evaluation-a case report from forensic psychiatric perspective in Türkiye

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### Abstract

Maternal filicide is the homicide of a child by the mother, it is defined as maternal filicide that multifaceted phenomenon and is often the subject of forensic psychiatric evaluation. A woman 32 years old is on trial for the homicide of her 3 years and 8 months old daughter by throwing her off the balcony. Investigation of her judicial file; 3 years and 5 months old son had also died in 3 years ago, falling from the 6th floor balcony and she had also been investigated in this regard. In her medical history, there is outpatient follow-ups and drug prescriptions with the diagnosis of 'behavioral disorders'. Psychiatric examination of the person in our department, she was in a simulation effort and was decided in presence of personality disorder rather than mental illness and reported as having full criminal responsibility. It should be kept in mind that malingering may occur as a component of personality disorders and the person should be taken under observation and an opinion should be given with attitudes and behaviours during hospitalisation and repeated examinations.

**Keywords:** Aggression, homicide, filicide, maternal filicide, mental disorders, personality disorder, malingering, criminal responsibility

### INTRODUCTION

'Filicide' is an umbrella term which is parent kills his / her own child. When the event occurs in first 24 hour the term 'neonaticide', in a first year 'Infanticide' used. Filicide behaviour includes non-intentional (such as abandonment or neglect) or intentional act of killing, to fatal ways (such as suffocation, strangulation, and stabbing) overt child homicide. If the perpetrator is father; 'paternal filicide' and mother; 'maternal filicide' is called [1-5].

According to Resnick's maternal filicide motivation categorization [6]; (1) Homicides committed out of love for the child in order to protect him/her from imaginary or real suffering. (2) Homicides associated with acute psychotic exacerbations, epileptic attacks or delusions. (3) Homicides in which an unwanted child is killed

to remove the mother from the mother's life. (4) Homicides involving children who die as a result of accidental or negligent deaths without a clear homicidal intention. (5) Homicides in which a child is killed to inflict pain on a spouse out of revenge.

Orban's categorization typology of maternal filicide perpetrators [7]; (1) mothers who beat their children (sudden and impulsive anger); (2) mothers with mental illness (diagnosed with psychosis or major depression); (3) neonatal homicide (identifies infants killed in the first 24 hours of life); (4) women motivated by revenge (aggression against a partner is projected onto the child); (5) unwanted children (children killed by neglect or deliberate killing); (6) mercy killings (killings in which the mother has nothing to gain but is motivated to end the child's suffering).

### CITATION

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Both categories included items describing situations in which maternal filicide occurred because of an acute exacerbation of psychosis, but other motivations were also identified. Some of these motivations were associated with personality disorders [7,8]. Personality disorders generally defines as impairment or dysfunction is an integral feature of whether extreme personality traits or behaviors. For example, Diagnostic and Statistical Manual of Mental Disorders (DSM) states that only “when personality traits are inflexible and maladaptive and cause significant functional impairment or subjective distress do they constitute Personality Disorders” [9].

It is a known fact that people with personality disorders, especially antisocial personality disorder, are more likely to be involved in crime and are prone to manipulation. In this context, they are frequently subjected to criminal responsibility assessment. Since they use their manipulation skills in these evaluations, it has been determined that they are often in simulation efforts. Simulation also named malingering is defined under some conditions the falsification or fabrication of observable and mental symptoms to gain desirable outcome. This includes the physical or mental benefits like leave from duty, tax/insurance settlement or fleeing from crime. Assessment of malingering in forensic context places great demands on the clinician, in addition to the definition above, the DSM-5 provides four factors, any combination of which is intended to prompt the clinician to “strongly suspect” malingering. Paraphrased, the factors are (1) medicolegal context of the presentation; (2) presence of Antisocial Personality Disorder (ASPD) in the subject; (3) subject who is uncooperative with evaluation and/or treatment; and a (4) marked discrepancy between the subjectively claimed symptoms and the objective findings and observations [10-13].

To sum up, maternal filicide is a tragic and complex crime despite the relatively low incidence of these offences, forensic mental health professionals are frequently confronted with various legal questions such as 'insanity, competence to stand trial, diminished capacity and criminal responsibility', although on a different basis in each country [14]. Important to find mental disorders, particularly personality disorders, to evaluate the criminal responsibility of the perpetrator. This article explores a case involving repeated incidents of maternal filicide, shedding light on the importance of assessing personality disorders and considering the possibility of malingering during forensic psychiatric evaluations.

## CASE

32 years-old- female is on trial for the murder of her 3 years old boy and 8 months old daughter by throwing them off the balcony and the court sent to our department for the evaluation of criminal responsibility in accordance with Article 32 (\*Turkish Penal Code, Article 32 (1) A person lacking ability to perceive the legal meaning and consequences of the offense, or having considerably lost the capacity to control his/her actions

due to insanity may not be subject to any punishment. However, security precautions are imposed for such individuals (2). Even if not to such an extent stated in the first subsection, a person lacking ability to control or direct his/her actions in respect of offense committed by him/her is sentenced to twenty five years imprisonment instead of heavy life imprisonment and to twenty years imprisonment instead of life imprisonment) of the Turkish Penal Code (The Turkish Penal Code (TPC, Law No. 5237) has been enacted in 2004 and is in force since 2005) [15,16].

In the examination of the judicial documents; according to witness statements (neighbours and relatives) she’s arguing with her neighbours continuously and neglect her child, she avoids giving care, couldn’t afford it. According to her husband she’s withdrawn, asocial, didn't talk much, sometimes had sudden temper tantrums. although the defendant stated in her statement that child fell spontaneously and that she did not throw her, it was determined that the person threw the child out of the window when the cameras that saw the scene were examined. When the judicial history of the person was evaluated, it was determined that her 3 years and 5 months old son had also died 3 years ago falling from the 6th floor balcony and that the person had undergone an investigation in this regard. In addition, in the statement of one of the witnesses, it was encountered that the defendant, with whom they had met at the funeral ceremony of the previous child, stated "say to my husband don't make me angry, I will throw this child out of the window too".

In the medical history of the patient, a medical board report on disability with the diagnosis of 'mild mental retardation' in a training and research hospital 3 years ago, outpatient follow-ups with the diagnosis codes 'non-organic psychotic disorders', 'generalised anxiety disorders', 'bipolar affective disorder', 'behavioural disorders' and 'depressive seizure' and 'Risperidone, There are drug prescriptions for the active substances 'Duloxetine, Quetiapine Fumarate, Sodium Valproate', there is also a report that criminal responsibility was evaluated in a training and research hospital and that the criminal responsibility was reduced with the diagnosis of 'behavioural disorders due to mild mental retardation' regarding this incident. The person did not comply with the Rorschach test and Kent EGY intelligence tests applied by us due to her negativist attitude, and her Intelligence Quotient (IQ) was determined as 61 in the SD Porteus Labyrinths test, again taking into account her low compliance. The diagnosis of 'behavioural disorders' that our case had received in the past and the fact that he was in simulation effort in the psychiatric examination and psychometric test studies were evaluated in the direction of personality disorder (mixt) and borderline intellectual functioning rather than mental disorder, and it was reported as full criminal responsibility.

Although maternal filicide cases are frequently encountered in the literature, its recurrent form as seen in our case was found to be rare, and our study was found valuable in this respect. It was aimed to raise awareness about the concept of filicide,

which causes emotional reactions in the society, by discussing the case of a mother who was involved in the murder of her two children by falling from apart.

## DISCUSSION

The case presented leads us to suggest that it is necessary to consider a more complex series of vulnerability factors, characteristics of the couples' relationships, and feared or imminent loss of the relationship [17]. These factors should be explored in addition to the usually discussed issues of relationship of the parents and child [18]. These factors may interact to become a toxic mix resulting in the fatal outcomes. Understanding of cases of maternal filicide, especially involving battering, retaliating or mentally ill women [19]. The issue of feared or actual loss of the spouse relationship has not been considered as a specific factor before [20]. The original 'Medea complex' formulation of Stern [21] related maternal violence to displaced anger from the husband, a theme continued in the 'retaliating mothers' as a revenge homicide subgroup in the later typologies of Resnick and d'Orban. The issue of anger towards to husband is obvious in this case [22].

Revenge type maternal filicide found tightly associated with personality disorders, especially antisocial personality disorders [23,24]. Our case was also evaluated in this subtype in accordance with the literature and personality disorder was found in the patient. In the light of the fact that people with personality disorders, especially antisocial personality disorder, are prone to manipulation [25] and are in an effort to malingering, our case was also in an effort to malingering during our criminal responsibility assessment examinations. We think that the report of reduced criminal responsibility with a diagnosis of mild mental retardation in a training and research hospital, which constituted a contradiction and caused the case to be sent to us, was a defence of insanity obtained by malingering due to the personality disorder of the person [26].

On the other hand thinking about our case's former diagnosis of 'depressive seizures' the treatment of depression may empower the mother. But if the mother feels helpless and tired, empowerment and treatment may activate her without changing the stress and may lead to suicidal and filicidal behavior [19]. Clinicians should pay attention to depressed mothers especially suicidal or even filicidal ideations. Because of that besides the treatment of depression should be advised stress diminished such as help taking care of child [27].

Unlike mental health clinicians who work in collaboration with patients and accept what they say as true in advance, professionals working in the field of forensic psychiatry [28], who try to determine criminal responsibility with the meticulousness of a detective, reveal their responsibilities in differentiating situations such as mental illness and personality disorders in people who commit maternal filicide offences, as in this case, in which we issued a report stating that criminal responsibility is complete.

## CONCLUSION

The crime of maternal filicide involves a significant tragedy for families and communities, especially when this crime becomes recurrent, leading to psychological trauma that can reach irreparable dimensions. Therefore, it is crucial for mothers who commit filicide to be placed under close monitoring and undergo more frequent psychiatric follow-ups. Additionally, considering the high association of revenge-type maternal filicide cases with personality disorders, ensuring the early diagnosis and treatment of these personality disorders can prevent the recurrence of the crime. However, it is considered important to conduct psychometric tests (MMPI-Minnesota Multiphasic Personality Inventory-etc.) and forensic psychiatric examinations to assess the criminal responsibility of individuals involved in this crime, given their manipulation skills and simulation efforts, which are components of personality disorders. It is even recommended to use tests such as M-FAST (The Miller Forensic Assessment of Symptoms Test) [29], RMT (Rey 15-Item Memory Test) [30-32] and WMT (Word Memory Test) [33] etc. that measure this propensity.

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### Conflict of Interests

*The authors declare that there is no conflict of interest in the study.*

### Financial Disclosure

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### Patient Informed Consent

*Informed consent has been obtained.*

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