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# Analysis of Forensic Cases in Patients Aged 65 and Older Presenting to the Emergency Department

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## Abstract

***Analysis of Forensic Cases in Patients Aged 65 and Older Presenting to the Emergency Department***

**Objective:** This study aims to analyze the reasons for emergency department (ED) admissions and outcomes of forensic cases among individuals aged 65 years and older, particularly those presenting due to traffic accidents, falls, or suspected abuse.
**Methods:** In this retrospective cross-sectional study, ED admissions to a university hospital between November 1, 2023, and November 1, 2024, were examined. A total of 412 forensic cases aged 65 and older with complete data were included. Cases were recorded based on admission reasons, trauma findings, and ED outcomes (hospitalization, discharge, death, etc.), and reviewed using the hospital information system NUCLEUS v9.40.205 (MONAD Software & Consulting, Türkiye). Data were analyzed using SPSS version 21.0. Categorical variables were presented as frequencies and percentages; continuous variables as means and standard deviations.
**Results:** The most common reasons for ED admission were traffic accidents (52.9%) and falls (22.8%). Patients presenting with suicide attempts (100%), domestic violence (80%), and suspected neglect/abuse (52.6%) were predominantly female. Fatal cases were associated with substance use (50%), multiple drug ingestion (16.7%), altered mental status (7.7%), falls (1.1%), and traffic accidents (0.9%). Among nursing home residents, suspected neglect was present in 63.3%, with falls (63.3%) being the leading cause of ED admission.
**Conclusion:** Traffic accidents are the most frequently encountered forensic cases in the geriatric population. Multidisciplinary approaches and increased forensic awareness through emergency medicine training may improve the detection of such cases. Preventive measures against falls in nursing homes and appropriate referral after ED discharge may enhance the management of these patients.

**Keywords:** Aged, elder abuse, falls, forensic medicine, nursing homes, traffic accidents

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## Öz

***Acil Servise Başvuran 65 Yaş ve Üzeri Adli Olguların Analizi***

**Amaç:** Bu çalışmanın amacı, adli vaka niteliği taşıyan trafik kazası, düşme, istismar gibi nedenlerle acil servise (AS) başvuran 65 yaş ve üzeri bireylerin başvuru nedenlerini analiz etmek ve AS sonlanımlarını değerlendirmektir.

**Yöntem:** Bu retrospektif kesitsel çalışmada, 01.11.2023–01.11.2024 tarihleri arasında bir üniversite hastanesinin AS başvuruları incelenmiştir. Verileri eksiksiz olan 65 yaş ve üzeri toplam 412 adli vaka; başvuru nedenleri, travma bulguları ve AS sonlanımları (yatış, taburculuk, ölüm vb.) dikkate alınarak kaydedilmiş ve hastane bilgi yönetim sistemi NUCLEUS v9.40.205 (MONAD Yazılım ve Danışmanlık; Türkiye) aracılığıyla taranmıştır. Veriler, SPSS 21.0 yazılımı kullanılarak analiz edilmiştir. Kategorik değişkenler için sayı ve yüzde, sürekli değişkenler için ortalama ve standart sapma hesaplanmıştır.

**Bulgular:** En sık başvuru nedenleri trafik kazaları (%52.9) ve düşmelerdir (%22.8). Suist girişimi (%100), aile içi şiddet (%80) ve ihmal/istismar şüphesi (%52.6) ile başvuran hastaların çoğu kadınlardan oluşmaktadır. Mortal vakalarda madde kullanımı (%50), çoklu ilaç alımı (%16.7), genel durum bozukluğu (%7.7), düşme (%1.1) ve trafik kazası (%0.9) ön plana çıkmaktadır. Huzurevlerinden başvuran hastalarda ihmal şüphesi (%63.3) yaygındır ve bu grupta düşmeler başvuru nedenlerinin başında gelmektedir (%63.3).

**Sonuç:** Geriatrik popülasyonda trafik kazaları en sık karşılaşılan adli vakalardır. Acil tıp eğitimi kapsamında adli tıp konularına yönelik farkındalık oluşturulması ve multidisipliner yaklaşımların teşvik edilmesi, bu vakaların daha etkin şekilde tanınmasına katkı sağlayabilir. Özellikle huzurevlerinde düşmelere karşı koruyucu önlemler alınması ve AS sonrası hastaların ilgili branşlara yönlendirilmesi, tedavi sürecinin daha etkin yönetilmesine yardımcı olacaktır.


**Anahtar Kelimeler:** Adli tıp, düşme, huzurevi, karayolu trafik kazaları, yaşlı, yaşlı istismarı

## INTRODUCTION

Violence and crime are growing concerns worldwide, and many victims seek emergency department (ED) care due to such incidents (1). With the increase in the aging population, the number of elderly adults visiting the ED is becoming more significant (2). The number of elderly patients presenting to the ED who qualify as forensic cases is steadily increasing; however, the uncertainty in identifying forensic cases among elderly individuals in our country remains a critical issue. While studies often address issues such as traffic accidents, falls, elder abuse, and suicide in this patient group, the forensic characteristics of elderly patients presenting to the ED with these complaints are not adequately emphasized.

Road traffic accidents (RTAs) are among the leading causes of morbidity and mortality in elderly patients worldwide, with recent studies reporting that nearly half of elderly RTA victims die as a result (3). Falls are the second leading cause of death due to unintentional injuries in individuals aged 65 and older, with 40% of this age group experiencing falls (4).

Elder abuse, which can include physical, emotional, and sexual abuse as well as financial exploitation, neglect, and abandonment, is reported to have a global prevalence of 10% (5,6). Nursing home residents are hospitalized more frequently than their peers, with common diagnoses including fall-related injuries, fractures, cardiovascular and respiratory diseases, and infections (7,8,9). The incidence of suicide in the elderly population has also risen globally, and substance use disorders in this age group remain a significant issue (10,11).

The uncertainty in directly identifying forensic cases among elderly patients presenting to the ED necessitates the accurate identification of these patients. The objective of this study is to analyze the forensic cases of patients aged 65 and older presenting to the ED of a university hospital, examine the ED outcomes of these cases, and evaluate how ED physicians approach these cases and the implementation of forensic medicine practices.

## METHOD

### Study Design

The data obtained from patients presenting to the ED of a university hospital were retrospectively analyzed.

### Inclusion Criteria

The study included forensic cases aged 65 and older who presented to the adult ED of Mersin University Faculty of Medicine Hospital between November 1, 2023, and November 1, 2024, with complete data.

### Exclusion Criteria

Patients aged 65 and older who presented to the ED with non-forensic conditions or had incomplete data during the specified period were excluded from the study.

### Data Analysis

Demographic data and ED presentation causes of the patients (e.g., traffic accidents involving vehicles and pedestrians, motorcycle accidents, falls from high or same level, ethanol-methanol intoxication, substance abuse, electrical injury, multiple drug intake/intoxication, assault, amputation, gunshot wounds, penetrating and stabbing

injuries, thermal burns, animal bites, suicide attempts, completed suicides or suicidal ideations, neglect and abuse, occupational injuries, neglect findings in nursing home residents, domestic violence), whether the patient was from a nursing home, requiring care or being disabled, psychiatric illness and medication history, trauma findings (head, thorax, abdomen, extremity trauma findings, bleeding, fractures, and organ injuries), and ED outcomes (admission, intensive care unit admission, need for emergency surgery, discharge, death, and others such as referrals, unauthorized discharge, or refusal of treatment) were recorded on a pre-prepared data form. If the same patient presented for multiple forensic reasons during the study period, each visit was considered a separate visit.

Due to the retrospective nature of the study, medical records were reviewed, and patients reported as forensic cases due to suspected neglect or abuse based on their initial complaints by emergency department (ED) physicians were included in the analysis. Among patients who presented to the ED for multiple reasons, cases raising suspicion of neglect (such as falls, physical assault, cardiovascular arrest, deterioration in general condition, or reduced oral intake) and/or abuse (physical, psychological, financial) were considered, and the most common complaints reported by the first physician to evaluate the patient were listed. In nursing home residents, neglect was identified when the first evaluating physician made a forensic case report based on the patient's presenting complaint, physical examination findings, and/or inconsistencies in the medical history.

The data were retrieved through the hospital information management system NUCLEUS v9.40.205 (MONAD Software and Consultancy; Türkiye).

The present study was performed upon the approval of the Clinical Research Ethics Committee, Mersin University Rectorate (dated December 25, 2024; No. 2024/1281).

### Statistical Analysis

The data were entered into a computer using a standard system and analyzed with the Statistical Package for Social Sciences (SPSS) 21.0 software. Descriptive statistics, including frequency and percentage for categorical variables, and mean and standard deviation for continuous variables, were provided.

## RESULTS

During the specified period, a total of 163,306 patients presented to the adult ED, of which 22,912 were aged 65 and older, and 7,469 were forensic cases aged 18 and older. The total number of forensic cases aged 65 and older included in the study was 415. After excluding 3 patients with incomplete data, the study included 412 patients with complete data. The proportion of patients included in the study was found to be 0.25% of the total ED presentations, 1.79% of the total presentations for patients aged 65 and older, and 5.51% of the total forensic cases aged 18 and older.

The mean age of the patients in our study was 73.5 ±7.2 years, with ages ranging from 65 to 97 years. 64.1% of the patients were male (n=264). Of the patients, 49.5% (n=204) were discharged from the ED, 22.8% (n=94) were admitted to the ward, 13.3% (n=55) were admitted to the intensive care unit, and 1.7% (n=7) required emergency surgery. The refusal of treatment rate was 5.8% (n=24), referral to another center was 3.6% (n=15), unauthorized discharge was 0.5% (n=2), and the mortality rate was 2.7% (n=11). Demographic data regarding the types of forensic cases among patients aged 65 and older are presented in Table 1.

**Table 1. Distribution of Forensic Cases in Individuals Aged 65 and Older Based on Demographic Data and Clinical Outcomes**

| | | | | Clinical Outcomes (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | n | Age (mean±SD) | Sex(%) | Discharged | Ward A. | ICU A. | ES | Deceased | Other |
| TA | 218 | 72.4±5.7 | 67 m | 46.3 | 22.9 | 16.5 | 1.4 | 0.9 | 11.9 |
| Fall | 94 | 76.6±8.7 | 56.4 m | 52.1 | 19.1 | 17 | 4.3 | 1.1 | 6.4 |
| N&A | 38 | 81.4±7 | 52.6 f | 50 | 18.4 | 10.5 | 2.6 | 2.6 | 15.8 |
| Assault | 37 | 71.8±6.9 | 70.3 m | 89.2 | 8.1 | - | - | - | 2.7 |
| PSI | 14 | 68.9±3.3 | 78.6 m | 50 | 50 | - | - | - | - |
| OI | 13 | 68.5±2.9 | 84.6 m | 53.8 | 46.2 | - | - | - | - |
| AMS | 13 | 84.4±6.9 | 53.8 m | 30.8 | 15.4 | 15.4 | - | 7.7 | 30.8 |
| Amp | 9 | 72.2±5.8 | 88.9 m | 33.3 | 66.7 | - | - | - | - |
| Arrest | 8 | 78.3±11.5 | 50 m | - | - | 12.5 | - | 75 | 12.5 |
| AB | 8 | 70.3±5.9 | 75 m | 50 | 25 | 12.5 | - | - | 12.5 |
| AI | 6 | 69.3±3.9 | 83.3 m | 100 | - | - | - | - | - |
| MDI | 6 | 70.3±6.1 | 66.7 m | - | 66.7 | - | - | 16.7 | 16.7 |
| DV | 5 | 85.6±2.7 | 80 f | 80 | 20 | - | - | - | - |
| Self-Harm | 4 | 71±6.9 | 75 m | 25 | 25 | - | - | 25 | 25 |
| SA | 4 | 76.5±3.3 | 100 f | - | 75 | - | - | - | 25 |
| Drug Use | 2 | 70±1.4 | 100 m | - | 50 | - | - | 50 | - |
| Snake Bite | 2 | 65.5±0.7 | 100 m | - | 50 | 50 | - | - | - |
| GW | 1 | 75 | 100 m | - | 100 | - | - | - | - |

SD: Standard deviation, m:male, f:female, ICU: Intensive care unit, A:Admission, ES: Emergency surgery, TA: Traffic accident, N&A: Neglect and abuse, PSI:Penetrating and stabbing injury, OI: Occupational injury, AMS: Altered mental status, Amp: Amputation, AB: Animal Bite, AI: Alcohol intoxication, MDI: Multiple drug intoxication, DV: Domestic violence, SA: Suicidal attempt, GW: Gunshot wound, Other: Refusal of treatment, referral to an external center, unauthorized discharge

The highest proportion of patients presenting to the ED were those with traffic accidents (52.9%); among these patients, 46.3% experienced pedestrian injuries (outside the vehicle), 40.4% were involved in motor vehicle accidents (inside the vehicle), and 13.3% were motorcyclists. The second most common reason for presentation was falls, accounting for 22.8% of the cases. Among the fall complaints, 75.5% were simple falls, while 24.5% were falls from a height. Among the patients presenting with fall complaints, 27.7% had

suspicion of neglect and abuse, 20.2% were nursing home residents, and 1.1% were recorded as occupational injuries. The most common injuries observed in patients aged 65 and older presenting to the ED with traffic accidents and falls are presented in Table 2.

**Table 2. The Most Common Injuries in Patients Aged 65 and Older Presenting to the Emergency Department Due to Traffic Accidents and Falls**

| | Traffic accident | % | Fall | % |
|---|---|---|---|---|
| 1. | Cranial trauma | 63.3 | Cranial trauma | 73.4 |
| 2. | Thoracic trauma | 56 | Thoracic trauma | 38.3 |
| 3. | Extremity trauma | 50 | Extremity trauma | 33 |
| 4. | Abdominal trauma | 26.6 | Abdominal trauma | 20.2 |
| 5. | Rib fracture | 25.7 | Rib fracture | 16 |
| 6. | Tibia/fibula fracture | 13.3 | Cranial fracture | 11.7 |
| 7. | Pulmonary contusion | 10.6 | Vertebral fracture | 9.6 |
| 8. | Cranial fracture | 10.6 | Subarachnoid hemorrhage | 9.6 |
| 9. | Subdural hemorrhage | 9.6 | Hip fracture | 8.5 |
| 10. | Subarachnoid hemorrhage | 9.6 | Subdural hemorrhage | 7.4 |
| 11. | Hemothorax | 7.8 | Pneumothorax | 5.3 |
| 12. | Vertebral fracture | 6.9 | Femoral fracture | 5.3 |
| 13. | Pneumothorax | 6.9 | Hemothorax | 4.3 |
| 14. | Pelvic fracture | 6.9 | Humeral fracture | 4.3 |
| 15. | Hip fracture | 6.9 | Pulmonary contusion | 3.2 |

The most common injuries observed in patients presenting with motor vehicle accidents and falls were cranial, thoracic, extremity, abdominal injuries, and rib fractures. However, in patients presenting with falls, femoral and humeral fractures were more commonly found, while in patients presenting after motor vehicle accidents, tibia/fibula and pelvic fractures were more frequently observed.

Among patients presenting with assault (8.9%), 10.8% were assessed as domestic violence cases, while 8.1% were suspected of neglect and abuse. Among patients presenting with penetrating and stabbing injuries (3.4%), 35.7% were identified as occupational injuries.

Among patients admitted with altered mental status (3.1%), 61.5% were suspected of neglect and abuse, and 30.8% were found to be nursing home residents.

Among patients presenting with amputation (2.1%), 44.4% were identified as occupational injuries. The most commonly affected area in these patients was the hand and wrist, accounting for 44.4%.

Among patients admitted with cardiac arrest (1.9%), 75% were found to be nursing home residents, and 12.5% were suspected of neglect and abuse.

Among patients presenting with multiple drug intoxication (1.45%), 16.7% had a history of psychosis, while among patients presenting with suicide attempts (0.9%), 75% had a history of psychiatric medication use due to depression, and 25% had a history of previous suicide attempts.

Among nursing home residents assessed as forensic cases (7.2%), 63.3% were suspected of neglect and abuse. The presenting complaints and injury areas of traumatic patients are shown in Table 3.

**Table 3. Demographic Data of Nursing Home Patients Considered as Forensic Cases**

| | Reason for Admission | (%) | Injury Site | (%) |
|---|---|---|---|---|
| 1. | Fall | 63.3 | Head trauma | 46.7 |
| 2. | Simple fall | 60 | Extremity trauma | 26.7 |
| 3. | Cardiovascular arrest | 20 | Thoracic trauma | 23.3 |
| 4. | Altered mental status | 13.3 | Abdominal trauma | 10 |
| 5. | Oral intake disorder | 13.3 | Hip fracture | 10 |
| 6. | Fever | 10 | Rib fracture | 6.7 |
| 7. | Fall from height | 3.3 | Cranial fracture | 3.3 |
| 8. | Respiratory pathology | 3.3 | Subarachnoid hemorrhage | 3.3 |
| 9. | Sepsis | 3.3 | Femur fracture | 3.3 |
| 10. | Other* | 16.7 | Humerus fracture | 3.3 |

*Other: Displacement of the PEG (Percutaneous Endoscopic Gastrostomy), urinary catheter insertion

## DISCUSSION

Our study provides significant insights into patients aged 65 and older who presented to the ED. Traffic accidents and falls were the most common causes of admission, while we found that patients presenting with domestic violence and altered mental status had a higher average age. We also observed that victims of domestic violence, suicide attempts, and those with suspected neglect or abuse were predominantly female. Among all forensic cases, those with a more severe prognosis were patients presenting with traffic accidents, falls, altered mental status, polypharmacy, and substance abuse. During the study period, we did not encounter cases of suspected methanol intoxication, electrical or thermal injuries, self-harm incidents, sexual assault, or completed suicide.

In the US, it has been reported that emergency department (ED) visits by older adults account for more than 15% of all ED visits (2). It is predicted that, in the next 20 years, the proportion of older adults will exceed 20%, and consequently, their ED visits will represent a larger share (12). In our study, the proportion of ED visits by patients aged 65 and older was found to be 14%, and our results are consistent with previous studies. The identification of forensic cases in 1.79% of these visits emphasizes the importance of recognizing forensic

cases as the aging population increases.

In our study, the most common causes of geriatric forensic ED visits were traffic accidents followed by falls. Although studies have found traffic accidents to be the most common forensic cases in EDs (13,14), other studies indicate that falls account for nearly three-quarters of all trauma cases in the geriatric population, while motor vehicle accidents make up almost the remainder (15). The difference in our study can be explained by the fact that every traffic accident case presenting to the ED was evaluated as a forensic case, whereas patients presenting due to falls were not necessarily evaluated as such. It is clear that ED physicians provide life-saving and urgent care for patients, but ED physicians, who frequently encounter forensic events, also have responsibilities in forensic medicine (16). Therefore, we believe that ED staff should evaluate every trauma case as potentially a forensic case, and that multidisciplinary training with forensic medicine units should be enhanced.

In a meta-analysis examining traffic accidents in older adults (3), it was found that most of the patients were between 60 and 74 years old, and the majority were male. The overall mortality rate was reported to be 14%. In our study, the average age of patients presenting with traffic accidents and the predominance of male cases were similar to previous studies, while we found a lower mortality rate. This may be attributed to factors such as the presence of another healthcare facility in the region where our hospital is located, the nature of traffic accidents, and socioeconomic differences.

One-third of adults aged 65 and older fall each year, and falls recur in half of these cases (17). Traumas due to falls commonly involve the head, chest, abdomen, and fractures of the forearm, hip, and femur (18). In our study, femur and humerus fractures were observed more frequently among patients presenting to the ED after a fall. A multifaceted approach, including walking and balance exercises, as well as medication adjustments, is required to prevent falls in older adults (19). In this context, recommending physical therapy for older patients discharged from the ED due to falls is an important step in preventing recurrent falls.

In the literature, elder neglect and abuse are defined as physical abuse, psychological or verbal abuse, sexual abuse, financial exploitation, and neglect or the failure of a designated caregiver to meet the needs of a dependent elderly person (5, 20, 21). Previous studies have reported that the prevalence of neglect and abuse in elderly individuals ranges from 7.6% to 10% (20, 22, 23), and it has been shown that elderly women are more likely to be abused compared to elderly men (20). In our study, we found that the group of patients suspected of neglect and abuse accounted for 9.2% of all forensic cases, and this group predominantly consisted of women. Our findings are consistent with the literature. In light of these results, we emphasize that ED physicians should carefully examine the complaints of elderly patients and remain sensitive to potential mistreatment of the geriatric population during the examination process to identify a significant proportion of patients suspected of neglect and abuse.

In our study, a large portion of the patients brought from nursing homes and considered as forensic cases were suspected of neglect. The most common reason for their ED visits was falls, followed by cardiovascular arrest, altered mental status, oral intake issues, fever, and respiratory pathologies. Previous studies have also noted that the most frequent reasons for hospital visits in this patient group include soft tissue injuries and fractures, cardiovascular and respiratory diseases, and infectious diseases (7, 8, 9). Furthermore, it has been emphasized that falls, especially those related to nursing home patients, account for a significant portion of hospital admissions (24). Taking preventive measures against falls and training healthcare staff for elderly patients in nursing homes could help reduce fall-related ED visits.

Occupational injuries are particularly common reasons for ED visits and also hold significant importance in forensic medicine practices. In our study, although the patients were aged 65 and older, 3.1% of the cases were due to occupational injuries, with the majority of this group consisting of male patients. It was found that 35.7% of patients who presented with penetrating and stabbing injuries, and 44.4% of patients who presented with amputations, were due to occupational injuries. The higher prevalence of occupational injuries among men has been explained by the role of men working in heavy industries, the higher likelihood of inexperienced individuals being prone to workplace accidents, and the increase in the construction sector due to urban transformation (25, 26).

In the literature, it has been reported that 90% of individuals who die by suicide have a psychiatric disorder (27). In our study, about one-fifth of patients who presented due to multiple drug intake had a history of psychosis, while three-quarters of patients who presented due to suicide attempts had a history of psychiatric medication use for depression, and one-quarter had a history of prior suicide attempts. In this context, ED physicians play an important role in assessing the suicide risk of patients and managing those with suicidal thoughts through psychiatric consultation.

Substance use disorder in older adults is a serious concern; however, it is often misdiagnosed and poorly treated. The reason for this is that withdrawal symptoms, such as tremors, sweating, feeling hot or cold, delirium, seizures, sudden heart issues, abnormal vital signs, hallucinations, and irritability,

can create symptoms that may be confused with other medical conditions (28). According to the National Council on Alcoholism and Drug Dependence (29), there are 2.5 million older adults with alcohol or drug problems, and 6% to 11% of ED admissions among older adults and 20% of psychiatric hospital admissions are due to alcohol or drug issues. In our study, we identified that 1.45% of ED visits were due to alcohol use and 0.48% were due to substance use. These rates may reflect a low level relative to the socio-demographic structure of our country. However, due to the confounding factors mentioned earlier, it is evident that clinicians should be suspicious of substance use in patients and be careful to ensure accurate forensic reporting.

## CONCLUSION

In our study, it was found that traffic accidents were the most common cause of forensic cases in the geriatric population, with other forensic cases being identified at lower rates. This highlights the need for ED physicians to increase their awareness of elderly patients and to ensure that forensic cases are not overlooked. Training in forensic medicine and geriatric health for emergency physicians could enable more effective identification of potential forensic cases. The increase of such training would not only enhance the treatment management of elderly individuals in the ED, but also improve the accuracy of forensic reporting, which is of critical importance for public health and justice system. Additionally, cases of neglect observed in elderly individuals living in nursing homes necessitate the strengthening of preventive healthcare measures. Specifically, taking fall prevention measures and making appropriate referrals to related units after ED evaluations will improve the treatment and protection of these patients. Our findings highlight the importance of raising awareness regarding the health management and protection of the elderly population and creating a more efficient system.

### Limitations

This study has several limitations. Firstly, the use of a retrospective design means that the data is based solely on existing records, which may lead to incomplete or inaccurate data. Additionally, the dataset, based on a single hospital, may be limited in its representation of the general elderly population. Furthermore, the inability to track patients who refused treatment, discharged themselves, were referred to other facilities, or left the emergency department without permission may result in missing cases and incomplete follow-up on emergency outcomes.

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### Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article.

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### Ethical Declaration

Ethical permission was obtained from the Sakarya University, Medical Faculty Clinical / Human Research Ethics Committee for this study with date 11/11/2019 and number 16214662/050.01.04/179, and Helsinki Declaration rules were followed to conduct this study.

### Authorship Contributions

Concept: CSB, HD, Design: CSB, HD, Supervising: AY, BG, SB, RSK, Financing and equipment: AY, BG, SB, RSK, Data collection and entry: AY, BG, SB, RSK, Analysis and interpretation: GOT, CSB, Literature search: GOT, CSB, Writing: CSB, AK, Critical review: CSB, AY, SB, AK, HD, BG, RSK, GOT

### List of Abbreviations:

USA: United States of America

ED: Emergency Department

RTA: Road Traffic Accident

WHO: World Health Organization

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