

## ORIGINAL ARTICLE

# Medicolegal Evaluation of Non-Fatal Occupational Accidents in the Province of Sanliurfa, Türkiye

## Şanlıurfa, Türkiye'deki Ölümcül Olmayan İş Kazalarının Medikolegal Değerlendirmesi

<sup>1</sup>Uğur Demir 

<sup>1</sup>Department of Forensic Medicine,  
Medical Faculty of Harran University,  
Şanlıurfa, Türkiye

## Correspondence

Assoc. Prof. Dr. Uğur DEMİR  
Department of Forensic Medicine,  
Medical Faculty of Harran University,  
63510, Şanlıurfa, Türkiye

E-Mail: [ugurdmr81@gmail.com](mailto:ugurdmr81@gmail.com)

## How to cite ?

Demir U. Medicolegal Evaluation of Non-Fatal Occupational Accidents in the Province of Şanlıurfa, Türkiye. Genel Tıp Derg. 2025;35 (2): 264-268

## ABSTRACT

**Aim:** This study aims to describe injuries resulting from occupational accidents treated at a university hospital in Şanlıurfa, Türkiye. The study provides information on age, gender, date of occupational accident, occupational accident sector, type of occupational accident, location of the wound, presence of brain/visceral lesion, type of wound, and discharge status.

**Methods:** In the study, hospital records for 10 years between 2014-2023 were retrospectively examined to determine occupational accident cases. Patient data were obtained from the hospital information management system. Occupational accident sectors were classified and injury locations were categorized.

**Results:** A total of 127 occupational accident cases were identified, with 92.9% being male and 7.1% female. The mean age was 35.3 ±11.03 years. The construction sector (32.3%) was found to have the highest case rate. The most common injury types were cuts/crushing/sharp/needle wounds (36.2%), fractures (27.8%), and blunt traumatic injuries (26.0%). Upper extremity trauma was the most frequent injury location (40.94%), followed by head trauma (14.96%) and lower extremity trauma (10.24%). Brain/internal organ lesions were present in seven cases.

**Conclusion:** Our study emphasizes the importance of understanding injury patterns to improve workplace safety. In our study, it is thought that work safety measures should be changed especially in the construction sector and protective measures for upper extremity injuries should be increased. Considering the regional and provincial differences in occupational accidents in our country, there is a need for multi-centered and larger dataset studies that include detailed statistical data on occupational accidents, sectors, and types of injuries.

**Keywords:** Accidents, injury, occupational, sector

## Öz

**Amaç:** Bu çalışma, Şanlıurfa'da bir üniversite hastanesinde tedavi edilen iş kazası kaynaklı yaralanmaları tanımlamayı amaçlamaktadır. Çalışmamız yaş, cinsiyet, iş kazasının tarihi, iş kazasının gerçekleştiği sektör, iş kazası türü, yaralanın lokalizasyonu, beyin/iç organ lezyonu varlığı, yara türü ve taburculuk durumu hakkında bilgi sağlamaktadır.

**Gereç ve Yöntem:** Çalışmada, 2014-2023 yılları arasındaki 10 yıllık döneme ait hastane kayıtları retrospektif olarak incelenerek iş kazası vakaları belirlenmiştir. Hasta verileri hastane bilgi yönetim sisteminden elde edilmiştir. İş kazası sektörleri sınıflandırılmış ve yaralanma lokalizasyonları kategorize edilmiştir.

**Bulgular:** Toplam 127 iş kazası vakası tespit edilmiş olup, vakaların %92,9'u erkek, %7,1'i kadındır. Ortalama yaş 35,3 ±11,03 yıldır. En yüksek vaka oranı inşaat sektöründe (%32,3) bulunmuştur. En sık görülen yaralanma türleri kesici/ezici/delici nitelikte yaralar (%36,2), kırıklar (%27,8) ve künt travmatik yaralanmalar (%26,0) olarak belirlenmiştir. Üst ekstremité travması en sık yaralanma lokalizasyonu (%40,94) olup, bunu kafa travması (%14,96) ve alt ekstremité travması (%10,24) izlemiştir. Beyin/iç organ lezyonu 7 vakada mevcuttur.

**Sonuç:** Çalışmamız, işyeri güvenliğini iyileştirmek için yaralanma modellerini anlamamanın önemini vurgulamaktadır. Çalışmamızda özellikle inşaat sektöründe iş güvenliği önlemlerinin değiştirilmesi ve üst ekstremité yaralanmalarına yönelik koruyucu önlemlerin artırılması gerektiği düşünülmektedir. Ülkemizdeki iş kazalarının bölgesel ve il bazındaki farklılıkları göz önünde bulundurduğunda, iş kazaları, sektörler ve yaralanma türleri hakkında detaylı istatistiksel verileri içeren çok merkezli ve daha geniş veri setli çalışmalara ihtiyaç duyulmaktadır.

**Anahtar Sözcükler:** İş, kaza, sektör, yaralanma

## Introduction

Occupational accidents are defined in the Occupational Health and Safety Law as "an incident that occurs in the workplace or during the execution of work, causing death or rendering the body physically or mentally disabled" (1).

It has been stated that occupation-related injuries affect victims, their families, employers, and the whole society due to their occupational consequences (2), and it has been stated that a total of 374 million non-

fatal occupational accidents occur worldwide every year, and this situation creates a significant economic impact (2,3).

Occupation-related accidents often result in serious injuries that require immediate medical attention, thus creating a significant additional burden on hospital emergency departments. Additionally, emergency departments serve as the first point of care for 78% of occupation-related injuries. This makes them important

both for emergency medical intervention and subsequent criminal investigation, while also being crucial for effective analysis of workplace accidents and hospital admissions, understanding underlying risk factors, and identifying occupational injury patterns that can inform workplace safety policies to develop effective occupational accident prevention strategies. The first steps to be taken to prevent occupational accidents are to measure the risk of death and injury by correctly identifying high-risk groups, to define whether there is a type of occupational accident frequently seen in certain sectors, and to define what types of injuries occur in a certain period and sector types (4,5).

Occupational accidents constitute a significant portion of forensic reports kept in emergency services due to reasons such as not giving enough importance to workplace safety, not taking the necessary precautions insufficiently or not paying any attention, expecting employees to work much more in less time for better results, personal inadequacies, incorrect behaviors, technical malfunctions (6,7). Injuries and deaths resulting from occupational accidents constitute an important part of forensic medicine practices, and since employees and employers have mutual responsibilities, any accident that occurs must be evaluated very carefully to see if it meets the definition of an occupational accident (7,8).

This study describes the injuries that occur after occupation-related accidents treated at Harran University Hospital and provides information about age, gender, date of occupational accident, sector of occupational accident, type of occupational accident, localization of wound, presence of brain/internal organ lesion, type of wound and discharge status, where work-related injuries are most common and aims to improve our knowledge. The results of our study will be able to contribute to the literature on this subject.

### Material and Methods

Patient data, including age, gender, date of work accident, sector of work accident, type of work accident, localization of wound, presence of brain/internal organ lesion, type of wound, and discharge status, were obtained from Sanliurfa Harran University Hospital Information Management System (FONET). Hospital records for 10 years between 2014-2023 were retrospectively reviewed and work accident cases were identified and included in the study. Records

with missing data and cases not meeting the definition of a work accident were removed.

Work accident sectors were classified as manufacturing sector, construction sector, transportation sector, service sector, other sectors, and cases where the sector was not defined in the medical document.

According to the location of the injury in the body during the work accident, it was classified as head trauma, face and neck trauma, eye injury, ear injury, upper extremity trauma, chest trauma, abdomen and pelvis trauma, lower extremity trauma, and spine trauma.

### Ethical Approval

This retrospective study was carried out with the permission of the Clinical Research Ethics Committee of Harran University Rectorate (Decision number: E-76244175-050.04-371324, dated: September 9th, 2024).

### Statistical analysis

Data were analyzed using SPSS for Windows version 21.0 software (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as mean and standard deviation (SD) values for continuous variables and as frequency (n) and percentage (%) for categorical variables. A Chi-squared test was used in the analysis of contingency tables when the sample size was > 5. A value of  $p < 0.05$  was accepted as the level of statistical significance.

### Results

In 10 years between 2014-2023, 127 patients were admitted to our hospital due to work accidents. Of the 127 patients, 118 (92.9%) were male, while nine (7.1%) were female. The mean age of men was  $35.92 \pm 11.15$  years and the mean age of women was  $27.44 \pm 04.90$  years ( $p=0.000$ ). A significant difference was found in gender distribution, with the mean age of males being significantly higher than that of females. This demographic distribution shows that male employees are at higher risk for occupational accidents.

Of the patients admitted to the hospital as a result of an occupational accident, 57.5% ( $n=73$ ) were between the ages of 18-35, 32.3% ( $n=41$ ) were between the ages of 36-50, and 10.2% ( $n=13$ ) were over the age of 50 ( $p=0.000$ ). The mean age of all cases was  $35.3 \pm 11.03$ , the youngest case was 18 years old, and the oldest case was 79 years old.

Cutters/crushing/cutting/penetration wounds were

the most common at 36.2% (n=46), followed by fractures at 27.8% (n=34), and Blunt traumatic injury (ecchymosis/bite wounds) at 26.0% (n = 33). Other types of injuries were significantly less frequent. Foreign bodies (eye/oral/anal/vaginal) were observed in 4.7% (n=6) of the cases, while undefined cases constituted 2.4% (n=3). Asphyxia findings and other injuries represented 1.6% (n=2) of cases each, while both burn and electrical burns/scalds and poisoning findings were the least common, occurring in 0.8% (n=1) of the cases (p=0,000). (Table 1).

**Table 1.** Types of Injuries, Occupational Accident Sector, and Body Localization after Occupational Accidents.

Type of Injuries	Total n	Total %	P-value P=0.000
Blunt traumatic injuries/ecchymosis/aggravations/bite wounds	33	26.0	
Fractures	34	27.8	
Cutters/cutters/crushing/cutting/penetration wounds	46	36.2	
Burn and electrical burns/scalds	1	0.8	
Foreign bodies (eye/oral/anal/vaginal)	6	4.7	
Asphyctic findings	2	1.6	
Poisoning findings	1	0.8	
Other injuries	2	1.6	
Undefined	3	2.4	
Occupational Accident Sector	Total n	Total %	P=0.000
Construction sector	41	32.3	
Service sector	13	10.2	
Manufacturing sector	12	9.4	
Transportation sector	3	2.4	
Other sectors	18	14.2	
Undefined	40	31.5	
Body Localization	Total n	Total %	P=0.000
Upper Limb Trauma	52	40.9	
Head Trauma	19	15	
Face And Neck Trauma	9	7.1	
Lower Limb Trauma	13	10.2	
Ear Injury	4	3.1	
Eye Injury	10	7.9	
Chest Trauma	7	5.5	
Spine Trauma	7	5.5	
Abdominal/Pelvic trauma	6	4.7	

When the occupational accident sectors were evaluated, it was revealed that the construction sector

constituted the largest proportion of cases, accounting for 32.3% (n=41) of the total. Other sectors represented the second most frequent category with 14.2% (n=18), followed by the service sector with 10.2% (n=13). The manufacturing sector constituted 9.4% (n=12) of the cases, while the transportation sector constituted the smallest proportion with 2.4% (n=3) (p=0,000) (Table 1). In our study, a significant relationship was found between the sectors and types of injuries (p=0,000). In other sectors, the vast majority of them were animal (horse and cow) attacks. This situation is because the university hospital is located far from the city and there is a horse racing center and a private integrated cattle and meat facility close to the hospital, resulting in a total of 10 occupational accident cases from these two facilities.

When the distribution of occupational accidents according to the injury site on the body was examined, it was determined that upper extremity trauma constituted 40.94% (n=52) of all cases, head trauma constituted 14.96% (n=19), lower extremity trauma constituted 10.24% (n=13), eye injuries constituted 7.87% (n=10), face/neck trauma constituted 7.09% (n=9), chest trauma constituted 5.51% (n=7), spine trauma constituted 5.51% (n=7), abdominal/pelvic trauma constituted 4.72% (n=6), and ear injuries constituted 3.15% (n=4) (p=0,000). (Table 1).

In our study, three of seven cases had brain lesions, three had thoracal lesions, two had abdominal lesions, and no brain or internal organ lesions were detected in a total of 120 cases.

When the discharge status of the cases was examined according to the nature of the injury, 72.4% (n=92) of them were discharged after recovery and 27.6% (n=35) had an injury that could cause disability, such as a bone fracture (p=0.000).

## Discussion

Recognizing the mechanism and regional characteristics of occupational accidents plays an important role in the prevention, medical management, and forensic evaluation of these injuries.

It has been stated that occupational accidents occur at a higher rate in men (98%) because they are employed in labor-intensive and high-risk sectors such as construction and manufacturing (3). Similarly, in South India, men were the most exposed to occupational accidents (86%) (9). It has been stated that the majority of the victims injured due to

occupational accidents in Turkey (73.10-97.50%) are men, and this situation is related to men being more involved in work and working in heavier jobs (10). Almeida et al. reported that the majority of victims are men (88.3%) (2). In our study, in line with the literature, 92.9% of occupational accidents occurred in men and the difference found was statistically significant.

It was reported that occupational accidents were most common in the 30-39 age group (42.5%) and in the construction sector (56.4%) (3). Sayhan et al. reported that the highest rate of injuries occurred in the 18-29 age group (75.7%) and in the construction sector (40.2%) (11). Some studies have indicated that occupational accidents occur most frequently in the machinery-automobile sector (22%) (12), the service sector (44%) (13) and the food sector (34.90%) (10). Almeida et al. reported that 62.1% of occupational accidents occur in the 25-45 age group (2). In the current study, it was determined that 57.5% of occupational accidents occurred in the 18-35 age group and most frequently in the construction sector (32.3%). The sectoral differences detected in the studies are due to the differences in the provinces where the studies were conducted, the distribution of the branches of work within the province, and the location of the hospital within the province. Our study and the literature show that workplace accidents mostly affect the young age group, that is, people in their most productive years. Therefore, it is necessary to give extra importance to preventing occupational accidents.

In a study conducted in Portugal by Almeida et al., it was stated that the most common main injury types among occupational accidents were falls from heights and traffic accidents (2). In a study conducted by Win et al. in Brunei, it was reported that the most common causes of occupational accidents were hitting objects/encountering falling objects (37.7%) and falling from heights (25%) (3). In Turkey, people are often exposed to sharp/needle injuries in workplaces (11,13,14). In some studies, it was reported that blunt object injuries (30.90%) and cutting tool injuries (15.60%) were detected (10). Sharp/needle injuries, which are reported to be the most common injury mechanism in Turkey in the literature, were also found to be the most common injury mechanism in our study and were seen in 36.2% of all cases.

In our study, it was determined that people are generally exposed to sharp/needle injuries in the construction sector frequently and that there is a

significant difference between the sector and the type of injury. This situation shows that there is a need for advanced protective equipment and additional safety protocols specific to the sector, especially in high-risk activities such as the construction sector, which includes machinery and construction tools.

In a study conducted by Win et al., it was reported that upper extremity traumas were the most common, at a rate of 43.9% (3). In a study conducted by Hösükler et al., the most common was reported in the upper extremity at a rate of 54.9% (10). It has been reported in the literature that occupational accidents are most frequently seen in the upper extremities (3,10), and in our study, consistent with the literature, 40.94% of the cases had occupational accidents as a result of upper extremity trauma.

In a study conducted by Almeida et al. in Portugal, it was stated that among the permanent occupational damage parameters determined by the labor court, Permanent Absolute Disability for Any Work was seen at a rate of 35% (2). In the first and third months after the occupational accident, 21.6% and 61.2% of the patients returned to work, respectively, in other words, 38.8% of the participants stated that they could not return to work, mainly because they felt partial recovery (63.8%), took sick leave (25.7%) or lost their job (8.6%) (15). In our study, it was seen that 72.4% (n: 92) recovered and were discharged, while 27.6% (n: 35) had an injury that could cause disability, such as a bone fracture. This result reveals that one in every three to four people suffers a disability-causing injury after an accident at a workplace and that these work accidents can have permanent effects on the lives and productivity of employees due to their serious nature.

### Study limitations

The biggest limitation of our study is the limited number of occupational accident cases. Secondly, our current study was retrospective and we could not extract more descriptive data. Finally, this study was conducted in a single tertiary hospital in the southeastern part of Turkey (18 km from the city center and residential areas) and large multicenter series are needed for useful results that broadly reflect national data.

### Conclusion

Our study emphasizes the importance of understanding injury patterns to improve workplace safety.

In our study, it was determined that occupational

accidents occur most frequently in the construction sector (32.3%), cutting/crushing/piercing injuries (36.2%) are the most common type of occupational accident injury, and upper extremity traumas (40.9%) stand out as the most common body part. In light of the data, it is thought that work safety measures should be changed especially in the construction sector and protective measures for upper extremity injuries should be increased. Considering the regional and provincial differences in occupational accidents in our country, there is a need for multi-centered and larger dataset studies that include detailed statistical data on occupational accidents, sectors, and types of injuries. In this way, after determining the dimensions of the problem, it will be possible to obtain data that will contribute to the studies to be carried out to prevent accidents and reduce accident rates with measures to be taken in workplaces.

### Conflict of Interest

The authors declared that they had no conflict of interest during the preparation and publication of this article.

### Funding

The authors declared that they did not receive any financial support during the research and writing process of this article.

### References

- Occupational Health and Safety Law No. 28339, Official Gazette, 30/6/2012. Accessed 1 December 2024. <https://www.mevzuat.gov.tr/MevzuatMetin/1.5.6331.pdf>
- Almeida I, Teixeira JM, Magalhães T. The impact of major occupational injuries on professional reintegration. A Portuguese medico-legal contribution. *J Forensic Leg Med.* 2022; 90:102391.
- Win KN, Trivedi A, Lai A, Hasylin H, Abdul-Mumin K. Non-fatal occupational accidents in Brunei Darussalam. *Ind Health.* 2021; 17:59(3):193-200.
- Zakeri H, Jahed Taherani H, Afshari Saleh L. A survey on occupational injuries and related factors among emergency patients of Mashhad teaching hospitals over a year. *J Inj Violence Res.* 2024 May 11;16(1).
- Demir U, Asirdizer M, Kartal E, Eti Y, Hekimoglu Y. An investigation of the effect of the COVID-19 (SARS-CoV-2) pandemic on occupational accidents (Tokat-Turkey). *Arch Environ Occup Health.* 2023;78(1):28-37.
- Hakkoymaz H, Öztürk C, Okyay RA, Gedik MS, Kilci Aİ, Güler Ö, Yaman FN, Koşargelir M. Evaluation of Occupational Accidents in a Tertiary Emergency Department Introduction. *Eurasian J Emerg Med.* 2020;19(2):121-6
- Bütün C, Beyaztaş F, Yaman S, Artar A, Öğüt O. Death due to Occupational Accident A Report of Two Cases. *Bull Leg Med.* 2015;20.116-119.
- Asıladağ K, Akbaba M, Annaç M. Forensic medical evaluation of patients admitted to the emergency department due to occupational accidents. *Eur J Ther.* 2017; 23(2): 49-54.
- Regina DL, Kanagalakshmi V, Alex RG. Profile, risk factors, and outcome of occupational injuries reported to the emergency department in a tertiary care hospital in South India. *J Family Med Prim Care.* 2020; 9:5684-8.
- Hösükler E, Turan T, Erkol ZZ. Analysis of injuries and deaths by trauma scores due to occupational accidents. *Ulus Travma Acil Cerrahi Derg.* 2022; 28(9):1258-1269.
- Sayhan MB, Sayhan ES, Yemenici S, Oguz S. Occupational injuries admitted to the emergency department. *J Pak Med Assoc.* 2013; 63(2):179-84.
- Satar S, Kekec Z, Sebe A, Sari A. Analysis of occupational injuries admitted To Cukurova University, School of Medicine Department of Emergency. *Cukurova Med J.* 2004; 29:118-27.
- Erdemli H, Kavalci C, Erdemli DS, Kocalar UG. Analysis of work-related injuries admitted patient to the emergency department. *J Surg Arts.* 2017; 2:26-33.
- Celik K, Yilmaz F, Kavalci C, Ozlem M, Demir A, Durdu T, Sonmez BM, Yilmaz MS, Karakilic ME, Arslan ED, Yel C. Occupational injury patterns of Turkey. *World J Emerg Surg.* 2013; 28:8(1):57.
- Abedzadeh-Kalahroudi M, Razi E, Sehat M, Asadi-Lari M. Return to work after trauma: A survival analysis. *Chin J Traumatol.* 2017;20(2):67-74.