



## The Medicolegal Evaluation of Occupational Injury Cases Applied to Emergency Department of Cumhuriyet University Hospital

Adem ARTAR<sup>1</sup>, Celal BÜTÜN<sup>2\*</sup>, Fatma YÜCEL BEYAZTAŞ<sup>3</sup>,

<sup>1</sup> Kütahya Health Sciences University Evliya Çelebi Training and Research Hospital, Department of Family Medicine, Kütahya, Turkey.

<sup>2</sup> Sivas Cumhuriyet University, Department of Internal Medical Sciences, forensic Medicine, Sivas, Turkey

<sup>3</sup> Sivas Cumhuriyet University, Department of Internal Medical Sciences, forensic Medicine, Sivas, Turkey

\*Corresponding author

### Research Article

#### History

Received: 18/10/2023

Accepted: 27/12/2023

### ABSTRACT

Work accidents are of great concern to society because they directly affect the health and life of workers and the production process of the enterprise, as well as creating significant social and economic costs for workers, employers, the country's economy and society. In this study, the total of 1.048 occupational injury cases who applied to Emergency Department of Cumhuriyet University Faculty of Medicine between 2011-2015 was evaluated.

In this study; frequency, chi-square and percentage tests were used in the analysis of data. 1.034 (98.7%) of the cases was male and the rest was female. The cases were more often between the ages of 25-34 (36.2%). 64.2% of applications to emergency were occurred between 08:01-17:00. The accidents were more often at metal/machine industry (20.8%). It was seen that it was not mentioned whether the injuries could be resolved with simple medical intervention in 84.4% of the reports. There wasn't an alcohol evaluation at most (92%) of the cases. Most of the injuries were located at upper extremity (39.6%). The most observed lesion was soft tissue damage (35.3%). 624 of the cases (59.6%) were discharged after treatment in emergency department. It was determined that the number of cases applied to the Department of Forensic Medicine by the prosecutor's office or court decision after occupational accident was 29 (2.8%); in 79.3% of cases, the injuries could be resolved with simple medical intervention; in 24.1%, there was life-threatening; in 3.4%, there was declining function; in 6.9%, there was loss of function.

Inadequacies in the writing of forensic reports will cause serious legal problems. In addition, it was concluded that it is important to raise awareness for all healthcare personnel, especially emergency physicians, and to provide up-to-date training for forensic case reporting and proper-complete preparation of forensic reports.

**Keywords:** Occupational injury, emergency, forensic medicine, medicolegal report, death.

## Cumhuriyet Üniversitesi Hastanesi Acil Servisine Başvurulan İş Kazası Olgularının Adli Hukuki Değerlendirilmesi

### Süreç

Geliş: 18/10/2023

Kabul: 27/12/2023

### Öz

İş kazaları, işçinin sağlığı ve hayatı ile işletmenin üretim sürecini direkt olarak etkilemesinin yanında işçi, işveren, ülke ekonomisi ve toplum açısından önemli sosyal ve ekonomik maliyetler yaratması nedeniyle toplumu yakından ilgilendirmektedir. Bu çalışmada 2011 ve 2015 yılları arasında Cumhuriyet Üniversitesi Tıp Fakültesi Hastanesi Acil Servise iş kazası nedeniyle başvuran 1.048 olgunun tamamı incelendi.

Bu çalışmadaki verilerin analizinde frekans, yüzde ve ki-kare testleri kullanıldı. Olguların 1.034'ü (%98.7) erkek ve sıklıkla 25-34 yaş grubunda (%36.2) olduğu saptandı. Kazaların %64.2'sinin 08:01-17:00 saatleri arasında gerçekleştiği, en çok (%20.8) metal/makine endüstrisinde olduğu belirlendi. Acilde düzenlenen adli raporların sonuç bölümünde %84.4'ünde yaralanmanın basit bir tıbbi müdahaleyle giderilebilecek nitelikte hafif olup/olmadığının belirtilmediği, %92.0'sinde alkol değerlendirilmesinin yapılmadığı saptandı. En fazla yaralanmanın üst ekstremitelerde (%39.6) olduğu, en fazla görülen lezyon tipinin (%35.3) yumuşak doku yaralanması olduğu, 624'ünün (%59.6) acil serviste tedavilerinin ardından taburcu edildiği saptandı. Kesin adli rapor için Adli Tıp Anabilim Dalı'na başvuran olgu sayısının 29 (%2.8) olduğu, yaralanma bulgularının %79.3'ünde basit bir tıbbi müdahaleyle giderilebilecek ölçüde hafif olmadığı, %24.1'inde yaşamsal tehlikeye neden olduğu, %3.4'ünde duyu veya organlarının işlevinde sürekli zayıflamaya neden olduğu, %6.9'unda duyu veya organlarının işlevinde yitirilmesine neden olduğu tespit edildi.

Adli raporlarda yetersizliklerin görülmesi ciddi sorunlar doğuracaktır. Konuyla ilgili çok sayıda yapılacak araştırma bulgularının ayrıntılı incelenmesi iş kazalarının asıl nedenlerinin tespit edilmesi ve önlenmesinde önem taşımaktadır. Bununla birlikte, özellikle acil hekimler olmak üzere tüm sağlık personeline farkındalığın sağlanmasının, adli olgu ihbarı ve adli raporların düzgün-eksiksiz düzenlenmesi için güncel eğitimler verilmesinin önem taşıdığı sonucuna varıldı.

**Anahtar sözcükler:** İş kazası, acil servis, adli tıp, adli rapor, ölüm.

### License



This work is licensed under Creative Commons Attribution 4.0 International License

<sup>1</sup> Adem\_1988-6@hotmail.com

<sup>2</sup> https://orcid.org/0009-0006-0589-4885

celal.butun@balikesir.edu.tr

<sup>3</sup> https://orcid.org/0000-0003-2738-6559

fbeyaztas@yahoo.com

https://orcid.org/0000-0001-9734-8908

**How to Cite:** Artar A, Bütün C, Beyaztas F, (2023) The Medicolegal Evaluation of Occupational Injury Cases Applied to Emergency Department Of Cumhuriyet University Hospital, Cumhuriyet Medical Journal, December, 2023, 45(4): 48-61

## Introduction

The World Health Organization defines the work accident as "an unplanned event that often leads to personal injuries, damage to machines, tools and equipment, and a temporary stoppage of production"<sup>1</sup>. With the rapid advancement of technology, occupational accidents have been increasing recently due to reasons such as taking the necessary precautions in workplaces incompletely or not at all, not giving due importance to occupational safety, and expecting much more production in a short time from employees in order to get better efficiency<sup>2-4</sup>. The occupational accidents, which are frequently encountered in emergency services and cause personal and social material and moral losses, are one of the urgent health problems that should be emphasized<sup>5</sup>.

According to International Labor Organization data; every 15 seconds in the world, a worker dies due to work accidents or occupational diseases, while 160 workers have a work accident. Almost 6,400 worker die every day due to work accidents or occupational diseases. There are 270 million work accidents every year and more than 313 million workers have non-fatal work accidents<sup>6</sup>.

Although occupational health and safety is considered an important issue in our country as well as in the world, every year many worker are injured or even lose their lives due to work accidents that could have been prevented. Work accident is one of the biggest risks that an employee may encounter in business life; It affects not only the employee but also his family financially and psychologically, and also it brings with it various problems that concern the employer and the state<sup>7-10</sup>. As in the majority of developing countries, there are difficulties in accessing actual data on work accidents in our country. Although there are many work accidents in our country and the material and moral damages are increasing day by day, studies and research on work accidents are limited. Keeping full and complete work accident reports is an important step in preventing future grievances and loss of rights. Disability and deaths due to work accidents are also encountered in forensic medicine practices. Due to deficiencies in the reports, we encounter problems in evaluating the results of the incident. In this study, it is aimed to emphasize the importance of work accidents for society, to evaluate the sociodemographic characteristics of those who had a work accident as well as the characteristic features of the accidents, to identify the deficiencies and errors in the forensic reports and hospital registry system, to draw attention to the development of the recording system and the

importance of medical records related to work accidents.

## Materials and Methods

This research is a descriptive study conducted to determine the sociodemographic characteristics of the forensic cases who applied to the Emergency Department of Sivas Cumhuriyet University Hospital due to a work accident in the five-year period between 01.01.2011 and 31.12.2015, how the incident occurred, in which line of work it was, whether a forensic report was kept and the content of the report, examination findings, alcohol level, social security, whether there is an application to the Department of Forensic Medicine after a work accident, final report findings, disability rate, whether a death has occurred due to a work accident. In this research, the data recorded in the hospital automation system and patient files were used.

The population of this research consisted of cases (n=1,263) who applied to Sivas Cumhuriyet University Hospital Emergency Department with work accident between 01.01.2011 and 31.12.2015, and no sample selection was made. It was aimed to evaluate all cases, but a total of 214 cases with insufficient and incomplete data in the hospital file, whose diagnosis was mistakenly entered as a work accident in the automation system, and one case who did not consent to the study were excluded from the study, and a total of 1,048 cases were included in the study. Limitations of the study are that this study was conducted only with work accident cases who applied to Sivas Cumhuriyet University Hospital Emergency Department, the data was obtained through records, and most important data (educational status, time spent in the sector, size of the place of work, etc.) could not be accessed.

The data in our study were uploaded to the SPSS (ver:22.0) program and the Chi-Square Test was used for statistical evaluation. When the assumptions regarding the Chi-Square distribution could not be met, the Monte Carlo model and Fisher Exact test, which are among the Chi-Square Exact tests, were used. The data are stated in the tables as the number of individuals and percentages, and the error level is taken as 0,05. A value of  $p < 0,05$  was considered significant. Ethics committee approval was received for this research from Cumhuriyet University Non-Interventional Clinical Research Ethics Committee with decision number 2016/09 dated 25.03.2016.

**RESULTS**

In this study, 98.7% of those who had a work accident were male, and the average age of the cases at the time of admission to the hospital was 33.44±9.83 (minimum:15, oldest:69). It was determined that the most cases were in the 15-24

age group, with 22.0%. It is seen that the number of occupational accidents experienced decreases significantly in people aged 45 and over, and the majority (91.9%) have health insurance (Table 1).

**Table 1. Distribution of Cases According to Some Demographic Characteristics.**

Gender	n	%
Woman	14	1,3
Man	1.034	98,7
<b>Total</b>	<b>1.048</b>	<b>100,0</b>
<b>Age Groups</b>		
15-24	231	22,0
25-29	175	16,7
30-34	204	19,5
35-39	152	14,5
40-44	143	13,6
45-49	83	7,9
50-54	39	3,7
55-59	12	1,1
60 age and above	9	0,9
<b>Total</b>	<b>1.048</b>	<b>100,0</b>
<b>Health Insurance</b>		
No	85	8,1
Available	963	91,9
<b>Total</b>	<b>1.048</b>	<b>100,0</b>

Of the cases who had a work accident and whose line of business specified facts, 20.8% were in the metal/machinery sector, followed by the construction sector (building works) with 13.7 % (Table 2).

**Table 2. Distribution of Cases According to Their Business Lines.**

Business Lines	n	%
Chemical matter	14	1,3
Metal/Machine	218	20,8
Construction (Building works)	144	13,7
Mine-sand-quarry	68	6,5
Transportation	8	0,8
About health	1	0,1
Food industry	20	1,9
Power plant	33	3,1
Textile	2	0,2
Tunnel and road construction	19	1,8
Train	15	1,4
Agriculture	5	0,5
Wood work	23	2,2
Communication	3	0,3
Vehicle repair	1	0,1
Natural gas	2	0,2
Other-Unspecified	472	45,0
<b>Total</b>	<b>1.048</b>	<b>100,0</b>

It was determined that the most work accidents occurred on Wednesday with 184 cases (17.6%), on Tuesday with 165 cases (15.7%) and on Monday with 159 cases (15.2%). It is seen that 719 (75.5%) of the total 1.048 work accidents occurred on weekdays and 257 (24.5%) occurred on weekends (Figure 1).

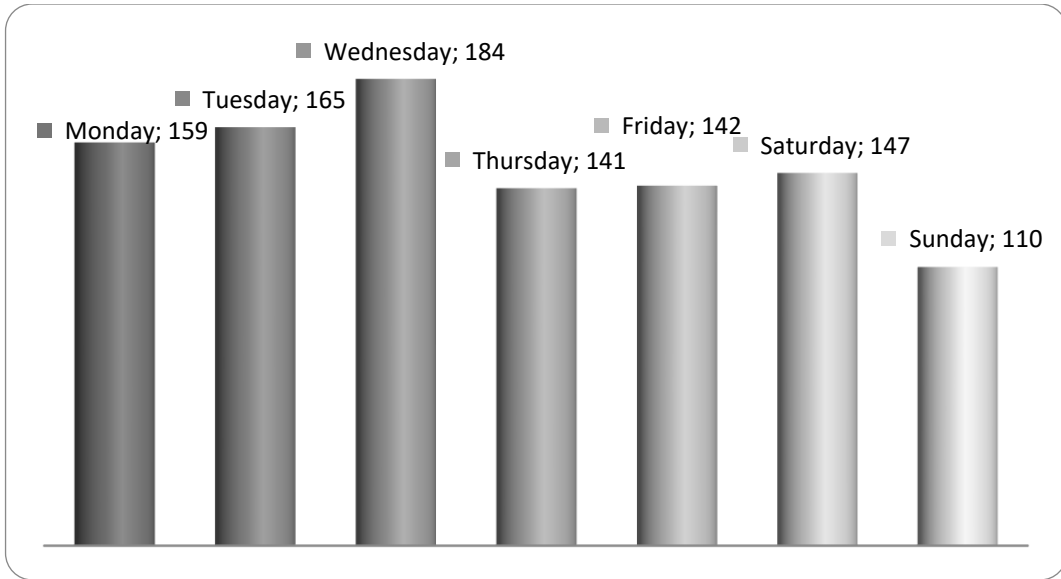


Figure 1. Distribution of Cases According to Application Days.

36.7% of applications to the emergency department as a result of work accidents occur between 12:01 and 17:00, 28.6% between 17:01 and 00:00, and 27.5% between 08:01 and 12:00. It was determined that the minimum application with 7.2% was between 00:01 and 08:00 hours (Figure 2).

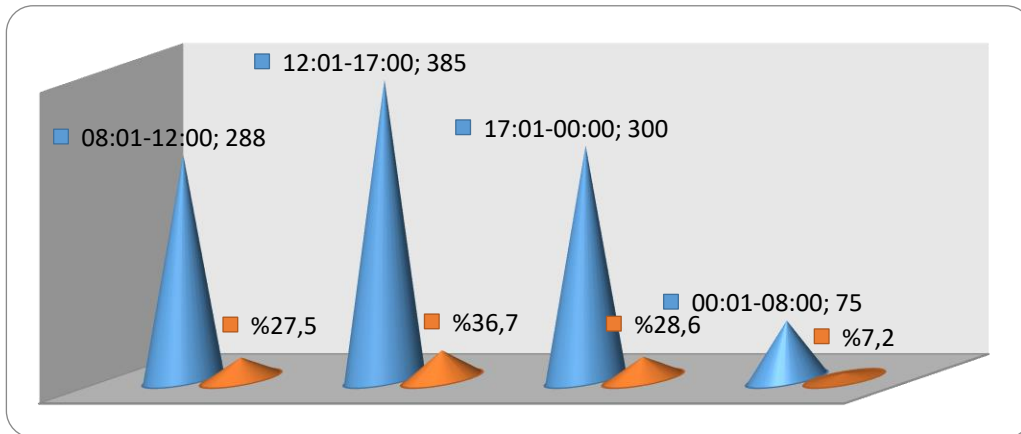


Figure 2. Distribution of Cases According to Application Times.

According to Table 3; It was found that out of 417 cases who applied to the emergency department after a work accident and for whom a forensic report was issued. In 352 reports (84.4%), it did not indicate whether the condition was mild enough to be resolved with a simple medical intervention, and in 408 reports (97.8%) it was stated whether it was life-threatening or not.

**Table 3. Distribution of Findings in Forensic Reports Prepared in the Emergency Department.**

	n	%
<b>Determining whether the condition is mild enough to be treated with simple medical intervention.</b>		
No	352	84,4
Yes	65	15,6
<b>Total</b>	<b>417</b>	<b>100,0</b>
<b>Indicating whether or not there is a danger to life</b>		
No	9	2,2
Yes	408	97,8
<b>Total</b>	<b>417</b>	<b>100,0</b>

Among the types of accidents, injuries caused by machinery/materials are the most common (36.8%), falling (22.1%) is the second most common type of work accident, and injuries caused by machinery/materials and cutting tools are the third most common with 13.3% (Table 4). In work accident cases, the most injured area is the upper extremity (39.6%), and the head-neck region (17.3%) is the second most injured area (Table 5). Considering the individual lesion type seen in the cases (Table 6); it was determined that the most common injuries were soft tissue injuries such as injury and tenderness at the skin-subcutaneous level (35.3%), followed by bone fractures (21.1%) and sub/total amputations (9.3%).

**Table 4. Distribution of Cases According to Types of Work Accidents.**

Type of Work Accident Occurrence	n	%
Injury by Machinery/Material	386	36,8
Fall*	232	22,1
Injury by Machinery/Material and Cutting Tool**	139	13,3
Injury with a Cutting Tool	95	9,1
Injury by Chemical Substance (Solid-Liquid-Gas)	39	3,7
Electric shock	31	3,0
Explosion	30	2,9
Traffic accident	28	2,7
Injury with a Pointed Object	28	2,7
Fire	9	0,9
Electric Shock and Fall	7	0,7
Being trapped under rubble	5	0,5
Other	19	1,8
<b>Total</b>	<b>1.048</b>	<b>100,0</b>

\*Falls from height and falls from the same level are taken together.

\*\*This type of injury occurred with machines that have cutting features such as sawmills, saws and spiral machines.

In terms of hospitalization duration of cases receiving inpatient treatment (Table 7), out of a total of 418 cases, those who were treated for 1-3 days are in the first place with 162 cases (38.8%), and the second place is 105 cases (25.1%) who were treated for 4-6 days. However, one of these cases died on the fourth day of hospitalization. It was determined that in 92% of the cases admitted with a work accident, alcohol measurement evaluation was not performed and the measurements were made only with a breathalyzer device. In this study, it was determined that 1,017 (97.2%) of the 1,046 cases, excluding the two cases that lost their lives, did not apply to the Department of Forensic Medicine, while 29 cases (2.8%) applied (Table 8). It was determined that in 23 (79.3%) of the 29 cases

who applied to the Department of Forensic Medicine, the injuries were not so mild that they could be resolved with a simple medical intervention, and in 22 (75.9%) the injuries did not cause a life-threatening situation.

According to Table 9; among the 29 cases who applied to the Department of Forensic Medicine after a work accident, the number of cases that did not receive a disability rate was 12 (41.4%), and the number of cases that received a disability rate between 10-50% was three (10.3%) and this situation was found to be statistically significant ( $p < 0.05$ ). The disability rates of three cases with disability rates between 10-50% were determined as 11%, 18.2% and 31%, in order of proportion.

**Table 5. Distribution of Cases According to Injury Regions Due to Work Accidents.**

Injury Site	n	%
Upper Extremity	415	39,6
Head-Neck	181	17,3
Lower Extremity	144	13,7
Three or More Body Parts	61	5,8
Chest	51	4,9
Head-Neck and Upper Extremity	42	4,0
Back	33	3,1
Upper and Lower Extremities	21	2,0
Abdomen	19	1,8
Head-Neck and Back	14	1,3
Upper Extremities and Back	13	1,2
Head-Neck Region and Lower Extremity	13	1,2
Chest and Back	11	1,0
Lower Extremities and Back	8	0,8
Lower Extremities and Abdomen	8	0,8
Head-Neck and Chest	8	0,8
Upper Extremity and Abdomen	6	0,6
<b>Total</b>	<b>1.048</b>	<b>100,0</b>

**Table 6. Distribution of Cases According to Lesion Types Caused by Work Accidents.**

<b>Lesion Types</b>	<b>n</b>	<b>%</b>
Skin-Subcutaneous Level Injury*, Sensitivity	370	35,3
Bone Fracture	221	21,1
Sub/Total Amputation	97	9,3
Burn	67	6,4
Eye Injuries**	48	4,6
Crush Style Injury	47	4,5
Muscle-Tendon Injury	42	4,0
Lesion Not Specified	31	3,0
Internal Organ Injury and Bone Fracture	31	3,0
Internal Organ Injury	19	1,8
Muscle-Tendon Injury and Bone Fracture	18	1,7
Nerve Injury and Bone Fracture	7	0,7
Muscle-Tendon Injury and Burn	7	0,7
Nerve Injury	5	0,5
Sprain-Dislocation	4	0,4
Ear Injuries***	4	0,4
Major Vascular and Nerve Injury	4	0,4
Major Vascular Injury and Bone Fracture	4	0,4
Major Vascular Injury	2	0,2
Other Injuries	20	1,9
<b>Total</b>	<b>1.048</b>	<b>100,0</b>

\*Lesions such as abrasions and abrasions

\*\*Lesions such as Foreign Body in the Eye - Eye Perforation

\*\*\* Lesions such as Acoustic Trauma - Eardrum Perforation



**Table 7. Hospitalization Duration of Cases Receiving Inpatient Treatment in Hospital**

<b>Hospitalization Duration</b>	<b>n</b>	<b>%</b>
1-3 days	162	38,8
4-6 days	105	25,1
7-10 days	61	14,6
11-15 days	34	8,1
16-20 days	29	6,9
20 days and above	27	6,5
<b>Total</b>	<b>418</b>	<b>100,0</b>

**Table 8. Evaluation of Forensic Reports Written in the Department of Forensic Medicine After Their Treatment of Cases Applying to the Emergency Department with Work Accidents.**

	<b>n</b>	<b>%</b>
<b>Application to Forensic Medicine Department</b>		
No	1.017	97,2
Yes	29	2,8
<b>Total</b>	<b>1.046</b>	<b>100,0</b>
<b>Whether the Injury Is Light enough to be Resolved with Simple Medical Intervention</b>		
Not light	23	79,3
Light	6	20,7
<b>Total</b>	<b>29</b>	<b>100,0</b>
<b>Whether the Injury Causes Life Danger or Not</b>		
Yes	22	75,9
No	7	24,1
<b>Total</b>	<b>29</b>	<b>100,0</b>
<b>Whether or not it causes permanent weakening/loss of sensory/organ function</b>		
ICZ* available	1	3,4
LA** available	2	6,9
ICZ/LA not available	12	41,4
Undetermined	14	48,3
<b>Total</b>	<b>29</b>	<b>100,0</b>

\* ICZ: Persistent weakening of function

\*\*LA: Loss of function

**Table 9. Distribution of Disability Rates Received by Cases Applying to Forensic Medicine Department.**

Disability Rate	Application to Forensic Medicine Department					
	Due to Work Accident					
	Not available		Available		Total	
	n	%	n	%	N	%
%0	0	0,0	12	41,4	12	1,1
%0-9	4	0,4	0	0,0	4	0,4
%10-50	2	0,2	3	10,3	5	0,5
>%50	5	0,5	0	0,0	5	0,3
Unknown	1.006	98,9	0	0,0	1.006	96,2
Undetermined	0	0,0	14	48,3	14	1,3
<b>Total</b>	<b>1.017</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>1.046</b>	<b>100</b>

 $\chi^2=254,54$  $p=0,0001$   $p<0,05$  important

## DISCUSSION

In this evaluation of the cases applicable to Cumhuriyet University Hospital Emergency Department due to work accident, the male rate among those was found to be 98.7%. In research on work accidents, the rates of men who have a work accident vary between 83.8% and 100.0%<sup>2,5,9,11-13</sup>. Studies conducted in our country and other countries find that male rates are higher in work accident cases, the reasons of that are due to the fact that men are employed in heavy jobs that require more active and physical strength in working life, and is due to the fact that women workers work in relatively lighter jobs.

The average age of the cases was  $33.44 \pm 9.83$  and most (36.2%) were in the 25-34 age group. This was followed by those in the 15-24 age group with 22.0%. Çelik et al.<sup>14</sup> was observed in the study conducted at Ankara Numune Training and Research Hospital; The average age of work accident cases was  $32.96 \pm 5.97$  and that it occurred most in the 26-35 age group with 37.0%. In a study conducted by Dağlı and Serinken<sup>5</sup> at Pamukkale University Hospital, the average age of work accident cases applying to the emergency department was  $32.7 \pm 9.7$ , and the age group of the cases was mostly in the 25-34 age group with 36.4%. Mehrdad et al.<sup>13</sup> found that the average age of work accident cases was found to be  $32.07 \pm 9.12$  and the

maximum age group was 25-34 with 47.6%. It was concluded that young age groups experience more work accidents due to the reasons such as younger age groups are more involved in business life, they are employed more in difficult and demanding jobs, and lack of experience and training in practice.

The cases applying with a work accident are examined in terms of the line of work they work in. It was determined that nearly half (45.0%) were not specified, the metal/machinery industry came first with 20.8%, and then the construction industry came next with 13.7%. According to 2015 Social Security Institution work accident statistics<sup>15</sup>. In Doğanlı's<sup>16</sup> study; it was stated that in the sectoral distribution of occupational accidents, the construction sector ranked first with 21.4%, followed by the machinery industry with 17.1%. While the data in our study are consistent with nationwide statistics, differences were observed in regional studies. It was concluded that these differences may have arisen due to reasons such as regional job opportunities and the development of the regional industry.

Distribution of work accidents according to days; it was determined that the most visits to the emergency department were on Wednesdays (17.6%) and Tuesdays (15.7%). 75.5% of the cases

applied to the emergency department on weekdays and 24.5% on weekends. Sayhan et al.<sup>17</sup> reported that 75.7% of the applications to the emergency department due to work accidents occurred on weekdays and 24.3% on weekends, and Ergör et al.<sup>18</sup> determined that the majority of work accidents occurred on weekdays (79.5%). Since employees are exposed to a continuous and intense work schedule during the mid-week and employers do not give them much opportunity to rest, they have difficulty in concentrating and adapting to the workplace, and their hasty behavior can lead to work accidents.

In this research, it was determined that most of the work accident cases with 64.2% applied to the emergency department during daytime working hours (08:01-17:00). Ulutaşdemir et al.<sup>9</sup> in their study on cases who applied to the emergency department of a private hospital due to a work accident; it was stated that work accidents mostly occurred between 08-17 hours (58.7%), and in the study of Dağlı and Serinken<sup>5</sup>, they mostly occurred between 08-10 and 14-16 hours. It was thought that more staff working in the work environment frequently during the daytime was effective, especially in the first working hours, as workers had difficulties in adapting to the working environment, focusing problems or concentrating attention when starting work.

It is a legal obligation that cases exposed to work accidents should be evaluated as "forensic case" and reported to law enforcement. The written findings, wording and conclusion of the forensic report, which has the nature of a notice, must be complete and in a language that the lawyer can understand. When the forensic reports of work accident cases are examined, whether it is stated whether it is mild enough to be resolved with simple medical intervention or not, and whether it is life-threatening or not; it was observed that the concept of whether it could be resolved with simple medical intervention was not stated in 84.4% of the cases, and that it was stated whether there was life-threatening or not in 97.8% of the cases. Bozkurt et al.<sup>19</sup> reported that it was stated in 91.5% whether it was life-threatening or not, and that it was not stated whether it would be resolved with simple medical intervention or not in 33.1%. It is a fact that these concepts are important for a fair trial. We think that doctors are not fully aware of whether it is necessary to indicate whether there is a life-threatening situation or not, and whether it is mild enough to be treated with simple medical intervention or not, and that is why they act hesitantly. In this regard, all physicians need to be informed and trained about the guide titled

"Forensic Medicine Evaluation of Injury Crimes Defined in the Turkish Penal Code".

The most common type of work accident was machine/material injury (36.8%). While the second occupational accident was falling (22.1%), the third (13.3%) was found to be injured by machinery/materials and cutting tools (such as sawmills, saws and spiral machines). Ergör et al.<sup>18</sup> found that 35.6% of occupational accidents consisted of being trapped under or between heavy objects, 21.0% falling, and 15.3% impact/collision type injuries. In a study conducted by Birgen et al.<sup>20</sup>; of the 59 cases whose type of accident was specified, the first one was due to a limb being caught in the machine in 30 cases (51%), and the second one (n=11, 19%) was caused by an object falling on. Evaluating of work accident cases that apply to the emergency department; Sayhan et al.<sup>17</sup> stated that the rate of injuries caused by sharp objects was 40.6%, injuries by falling were 16.7%, and injuries by being trapped under heavy objects were 11.4%.

When the injury areas resulting from work accidents are examined, the most injured area was the upper extremity (39.6%), followed by the head and neck region (17.3%). Following these, the lower extremity region (13.7%) was ranked third. Özkan et al.<sup>21</sup> in their examination of work accident cases that applied to the emergency department; 56.6% of all injuries are upper extremity injuries, 17.6% are lower extremity injuries, and 10.1% are head and neck injuries. Kekeç et al.<sup>22</sup>, in their study on occupational accidents that applied to the emergency department, reported that the body part most injured in accidents was the upper extremity. Çelik et al.<sup>14</sup> ; reported that upper extremity injuries were 53.7%, lower extremity injuries were 15.3%, and head and neck injuries were 13.3%. Karakurt et al.<sup>23</sup> stated that in cases related to work accidents, the most injuries occur on the extremities (62.0%) and in the head (22.0%). Yavuz et al.<sup>24</sup>, in the evaluation of work accident cases applying to the emergency department, it was determined that injuries were most common in the upper extremity (46.2%), followed by the lower extremity (19.7%) and head area (18.2%). Upper extremity injuries are more common in work accidents, especially since the upper extremities are used more in most lines of work.

In terms of lesion types, mostly (35.3%) are tenderness, soft tissue injury such as skin-subcutaneous level, bone fracture (21.1%), sub/total amputation (9.3%), burn (6.4%) has been seen. Ulutaşdemir et al.<sup>9</sup> reported that 45.1% had soft tissue trauma and 27.8% had fractures. Özkan

et al.<sup>21</sup> in their study, soft tissue traumas occurred in 36.7% of work accident cases, cuts and lacerations occurred in 26.3%, fractures and dislocations occurred in 11.2%, amputation occurred in 6.9%, and burns occurred in 1.45%. According to Social Security Institution statistics, it has been reported that soft tissue traumas (46.4%) come first as a result of work accidents, followed by dislocations, sprains and strains (14.8%), bone fractures (7.5%) and burn findings (2.5%)<sup>15</sup>.

In our study, both cases (0.2%) who died were male. Çelik et al.<sup>14</sup> reported that 0.3% of the cases admitted due to work accidents died; 0,25% in the study by Karakurt et al.<sup>23</sup> and 0.8% in Dağlı and Serinken's<sup>5</sup> study. The majority of the cases admitted with a work accident (Table 7) were discharged after outpatient treatment. This is an indication that injuries due to work accidents are mild enough to require outpatient treatment, meaning that they are generally preventable injuries.

In our study; when the cases receiving inpatient treatment were examined according to the duration of their hospital stay, the most (38.8%) were treated for 1-3 days (Table 7). Beyaztaş et al.<sup>25</sup> on occupational accidents in Sivas province, stated that 35.4% of the cases receiving inpatient treatment received treatment for less than 10 days, and 7.3% received treatment for 10-19 days. Considering time the patients spend in the hospital and the rest period after discharge, it should be emphasized once again that occupational accidents must be prevented in order to prevent such material and moral losses, as they will cause more workday losses.

There are also cases where alcohol measurement is required in work accidents, which is important for compensation. Therefore, not having an alcohol assessment may create a legal problem. In our study, it was determined that alcohol assessment was not performed in 92% of the cases admitted to the emergency department and that the assessment was made only with a breathalyzer device. Budakoğlu et al.<sup>26</sup> in a survey study conducted by regarding the frequency of occupational accidents and the risk factors, stated that the exposure to of workers who use alcohol is higher than those who have never drank, quit drinking, those who drink occasionally. In the majority of cases, alcohol content was not checked. This may be due to technical deficiencies in the hospital, overcrowding in the emergency room, or the fact that the patient did not give the impression that he or she might be drunk.

In this study, the cases that applied to the emergency department due to a work accident were contacted by Department of Forensic Medicine of Cumhuriyet University for an additional report after their treatment, through the prosecutor's office or the court. When the distribution of cases (2.8%) applying to the Department of Forensic Medicine is examined; it was determined that in 79.3% of the cases, the injury was not so minor that it could be resolved with a simple medical intervention, and in 24.1%, the injury was life-threatening. It was determined that it caused permanent weakening of function in 3.4%, caused loss of function in 6.9%, and did not result in 48.3% because re-application was expected after the completion of the recovery process. The disability rates of the cases who applied to the Department of Forensic Medicine, where it was decided whether the function of one of their senses or organs was permanently weakened or lost were as follows; it has been determined that 41.4% have not received an disability rate, 10.3% have received a rate between 10-50%, and 48.3% have not yet been concluded in terms of disability rate. Among those who received a disability rate, the highest rate was found to be 31%. The large difference in the rate between the number of cases applying to the emergency department and the number of applications to the Department of Forensic Medicine, may be due to the fact that the cases are not reflected in the judicial dimension due to reasons such as disruptions, delays in the judicial processes, other hospital preferences, the cases agreeing with the employer or not complaining.

## CONCLUSION and RECOMMENDATIONS

Ignoring measures for occupational health and safety due to reasons such as competition in a global world order, rapid changes in technology, and efforts to reduce costs causes an increase in the incidence of occupational accident<sup>27</sup>. Recommendations for preventing occupational accidents, along with supporting training for workers and employers, are as follows:

- In working life; Health screening of people during recruitment, assessing their suitability for the job, providing training on the job they will do, repeating this training with up-to-date information for certain periods of time, and ensuring adaptation to the job at intervals will make serious contributions to a safe working life.
- Individuals should be made aware of the use of personal protective equipment and it should be emphasized that they should use it for their own safety, not out of necessity.

•By performing risk analyzes at regular intervals in businesses, worker and work-related risks can be identified and hazards can be minimized.

•By ensuring that the person who has suffered any kind of work accident, whether heavy or light, applies to a health center, complete and accurate data can be obtained, the real extent of the work accidents can be seen and the necessary precautions can be taken.

•Physicians may be held legally responsible and face criminal and compensation lawsuits as a result of any errors or omissions they make in preparing forensic reports. Therefore, physicians need to know how to approach forensic cases, write reports, and what their responsibilities are.

•In most cases of work accidents, the first physician to see the person must determine whether there is alcohol in the person in order to solve problems that may arise later.

•By ensuring that occupational health and safety training is provided to both employees and

employers, accidents will be minimized by taking simple precautions.

•It can be ensured that the safety measures required to be taken in the working environment are audited not only by the company's employees but also by independent auditing institutions.

employers, accidents will be minimized by taking simple precautions.

•Various problems will arise if the event that causes the application of a forensic case is mistakenly entered as a different event in the hospital automation system. In order to prevent loss of time, it is necessary to install warning software for forensic cases in the automation system.

## References

1. Bertan M, Güler Ç. Halk Sağlığı Temel Bilgiler. Güneş Yayınevi, Ankara. 1997:210-25.
2. Kalemoglu M, Keskin Ö, Yıldırım İ, Erşanlı D. Acil servise başvuran travmatik iş kazalarının incelenmesi. Nobel Medicus, 2006;2(1):21-3.
3. Almeida I, TeixeiraJM, Magalhaes T. The impact of major occupational injuries on professional reintegration. A Portuguese medico-legal contribution. Journal of forensic and legal medicine, 2022;90. Doi.org/10.1016/j.jflm.2022.102391.
4. Oğuzlar FÇ, Armağan HH, Bedel C, Tomruk Ö, Beceren NG. Acil servise başvuran iş kazalarının değerlendirilmesi. Genel Tıp Dergisi, 2021;31(1):12-7.
5. Dağlı B, Serinken M. Acil servise başvuran iş kazalarına bağlı yaralanmalar. The Journal of Academic Emergency Medicine, 2012;11(3):167-70.
6. İşçi Sağlığı ve İş Güvenliği Oda Raporu. TMMOB Makina Mühendisleri Odası. Ankara. Şubat, 2016.
7. Arslan MM, Eren A, Çekin N. Adana'da iş kazalarına bağlı ölümler. Türkiye Klinikleri Journal of Forensic Medicine, 2009;6(2):60-4.
8. İnce H. Adli tıp açısından iş kazalarının değerlendirilmesi. Adli Tıp Bülteni, 2003;8(3):82-7.
9. Ulutaşdemir N, Tanır F, Dokur M, Uysal E. Bir özel hastanenin acil servisine iş kazası nedeniyle başvuran hastaların analizi. Sakarya Tıp Dergisi, 2015;5(4):193-8.
10. Asıldag K, Akbaba M, Annac M. Forensic medical evaluation of patients admitted to the emergency

- department due to the occupational accidents. European Journal of Therapeutics, 2017;23(2). Doi.org/10.5152/EurJTher.2017.03031
11. Korkmaz T, Kahramansoy N, Erkol Z, Sarıçıl F, Kılıç A. Acil servise başvuran adli olguların ve düzenlenen adli raporların değerlendirilmesi, Haseki Tıp Bülteni 2012;50(1):14-20.
12. Yavuz MS, Ozguner IF. Süleyman Demirel Üniversitesi Tıp Fakültesi Acil Servisine 1999-2001 yılları arasında müracaat eden adli olguların değerlendirilmesi. Adli Tıp Dergisi, 2003;17(1):47-53.
13. Mehrdad R, Seifmanesh S, Chavoshi F, Aminian O, Izadi N. Epidemiology of occupational accidents in Iran based on social security organization database. Iranian Red Crescent Medical Journal, 2014;16(1).
14. Çelik K, Yılmaz F, Kavalci C, Ozlem M, Demir A, Durdu T et al. Occupational Injury Patterns of Turkey. World Journal of Emergency Surgery, 2013;8(57):1-6.
15. 2015 Yılı SGK İstatistikleri ([http://www.sgk.gov.tr/wps/portal/sgk/tr/kurumsal/istatistik/sgk\\_istatistik\\_yilliklari](http://www.sgk.gov.tr/wps/portal/sgk/tr/kurumsal/istatistik/sgk_istatistik_yilliklari)) Erişim Tarihi:18/11/2016.
16. Doğanlı SO. Acil Servise İş Kazası Nedeniyle Başvuran Hastalarda Dikkat Eksikliği ve Hiperaktivite Bozukluğu İlişkinin Değerlendirilmesi. Uzmanlık Tezi. Pamukkale Üniversitesi Acil Tıp Anabilim Dalı. Denizli, 2015.

17. Sayhan MB, Sayhan ES, Yemenici S, Oguz S. Occupational injuries admitted to the emergency department. *J Pak Med Assoc*, 2013;63(2):179-84.
18. Ergör OA, Demiral Y, Piyal YB. A significant outcome of work life: Occupational accidents in a developing country, Turkey. *Journal of Occupational Health*, 2003;45:74-80.
19. Bozkurt S, Daraoglu V, Okumus M, Savrun A , Karanfil R, Gok AA. Evaluation of judicial reports which executing on emergency service and fixed deficiencies. *Journal of Clinical and Analytical Medicine*, 2015;6(3):331-4.
20. Birgen N, Yavuz M, Okyay M. İş kazası olgularının adli tıp açısından değerlendirilmesi. *Adli Tıp Dergisi*, 2001;15(2):14-8.
21. Özkan S, Kılıç Ş, Durukan P, Akdur O, Vardar A, Geyik S et al. Occupational injuries admitted to the emergency department. *Ulus Travma Acil Cerrahi Derg*, 2010;16(3):241-7.
22. Kekeç Z, Ünalın D, Şenol V, Çetinkaya F. Erciyes Üniversitesi Tıp Fakültesi acil servisine başvuran iş kazalarının değerlendirilmesi. *Fırat Üniversitesi Sağlık Bilimleri Tıp Dergisi*, 2003;17(4):277-83.
23. Karakurt Ü, Satar S, Açıkalin A, Bilen A, Gülen M, Baz Ü. Acil tıp kliniğine başvuran iş kazalarının analizi. *Journal of Academic Emergency Medicine*, 2013;12:19-23.
24. Yavuz MS, Asirdizer M, Ulucay T, Zeyfeoglu Y, Erbuyun K, Gullucayir S. İş Kazası Sonucu Acil Servise Müracaat Eden Olgular 6. Anadolu Adli Bilimler Kongresi. Manisa, Sözel ve Poster Bildiriler Kitabı. 2007:102-7.
25. Beyaztaş F, Alagözlü H, Demirkan Ö. İş kazası olgularının adli tıp yönünden değerlendirilmesi. *Adli Tıp Dergisi*, 2001;15(3):18-24.
26. Budakoğlu İ, Bakar C, Atlı K, Akgün HS. Çalışan işçilerde iş kazaları sıklığı ve bazı risk faktörleri. *TBB Mesleki Sağlık ve Güvenlik Dergisi*, 2007;27-32.
27. Çolak B, Öztürk MO. İş kazasına bağlı yaralanmalar ve işyeri hekiminin bazı yükümlülükleri. *Mesleki Sağlık ve Güvenlik Dergisi*, 2015;11(40)