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Evaluation of Clinical Characteristics and Costs of Patients Applied to the Emergency Department Due to Occupational Accidents

İş Kazası Nedeniyle Acil Servise Başvuran Hastaların Klinik Özellikleri ve Maliyetlerinin Değerlendirilmesi

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Öz

Amaç: İş kazası, işyerinde meydana gelen ve yaşanan travma nedeniyle sakatlık veya ölümle sonuçlanan bir olay olarak tanımlanmaktadır. İşgücünün göçü, buna bağlı mali yük ve ülkelerin sağlık sistemleri ile kurumların bütçeleri için yankılar ile karakterizedir. Bu çalışmada, iş kazaları nedeniyle acil servise başvuran hastaların demografik verileri ve hastane maliyetlerinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler: Çalışma etik kurul onayı doğrultusunda yürütülmüştür. Mustafa Kemal Üniversitesi Hastanesi acil servisine iş kazaları nedeniyle yaralanmalarla başvuran hastalar değerlendirilmiştir. Demografik veriler, başvuru zamanı, yaralanan vücut parçaları ve sağlık hizmeti maliyetleri, IBM Statistical Package for the Social Sciences sürüm 22 yazılımı kullanılarak frekans değerleri ve kategorik analizler için analiz edilmiştir.

Bulgular: Acil serviste 150 hasta gözlemlenmiştir; bunların 124'ü (%82,66) erkektir. Bu hastaların ortalama yaşı 36,5±10,4 yıldır. En sık görülen mesleki kaza 41 hastada (%27,33) delici ve kesici alet yaralanmasıydı. Acil serviste takip edilen hastaların %52,67'sinin (n=79) triyaj kodu yeşildi. Vakaların çoğu günün ilk vardiyası olan sabah 8 ile akşam 4 arasında gözlendi. Vardiyalar arasında anlamlı bir fark gözlenmedi (p=0,6875). Hastalar en sık Ocak ayında (n=16) %10,67 ile hastaneye yatırıldı. Üst ekstremite yaralanmaları %53,3 ile en sık görülen vakalardı. Pelvis %6 oranıyla en az travmatize olan vücut parçasıydı. Takip edilen hastalarda mortalite görülmezken hastaların %96,67'si acil servisten taburcu edildi. Hastaların sağlık hizmetlerinin ortalama maliyeti, 2020 ortalama döviz kuru olan 7,0 TL/USD'ye göre 16,7 ± 19,5 USD idi.

Sonuç: İş kazalarında sık görülebilen kafa, üst ve alt ekstremite yaralanmalarının önlenmesi için tedbirler alınmalı ve eğitimler artırılmalıdır. Bu durumun morbidite, mortalite ve maliyetin azalmasında etkili olacağı kanaatindeyiz.

Anahtar Kelimeler: Acil Servis, İş Kazaları, Maliyet, İşgücü

Abstract

Aim: An occupational accident is defined as an event that takes place in the workplace and results in disability or death due to the trauma sustained. It is characterised by an exodus of the workforce, a corresponding financial burden, and repercussions for the health systems of countries and the budgets of institutions. In this study, it was aimed to evaluate the demographic data and hospital costs of patients admitted to the emergency department due to occupational accidents.

Methods: The study was conducted in accordance with the approval of the ethics committee. Patients who had been admitted to the emergency department of Mustafa Kemal University Hospital with injuries due to occupational accidents were evaluated. Demographic data, time of presentation, body parts injured and healthcare costs were analysed by using IBM Statistical Package for the Social Sciences version 22 software for frequency values and categorical analyses.

Results: 150 patients were observed in the emergency department; 124 (82.66%) of these were male.The mean age of these patients was 36.5±10.4 years. The most common occupational accident was piercing and cutting tool injury in 41 patients (27.33%). The triage code of 52.67% of the patients (n=79) followed up in the emergency department was green. The majority of cases was observed between 8 am-4pm hours, the first shift of the day. No significant difference was observed between shifts (p=0.6875). Patients were most frequently admitted in January (n=16) 10.67%. The upper extremity injuries were the most common cases with 53.3%. Pelvis was the least traumatised body part with a rate of 6%. While mortality was not observed in the patients followed up, 96.67% of the patients were discharged from the emergency department. The mean cost of the patients health care was 16.7 ± 19.5 USD, based on the 2020 average exchange rate of 7.0 TL/USD .

Conclusion: Measures should be taken and trainings should be increased to prevent head, upper and lower extremity injuries, which can be seen frequently in occupational accidents. We believe that this will be effective in reducing morbidity, mortality and cost.

Keywords: Emergency Department, Occupational Accidents, Cost, Workforce

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INTRODUCTION

The events that occur in the workplace or in the area where the work is carried out, resulting in physical injury, mental damage, disability or death are called occupational accidents (2). According to the statement made by the International Labour Organisation, more than 337 million occupational accidents occur on average every year. Together with occupational diseases and work accidents, the annual number of deaths is over 2.3 million (3). According to the report published by International Labour Organisation (ILO) in 2023, approximately 330,000 people die each year due to occupational accidents. Particularly, the agriculture, construction, forestry, fishing, and manufacturing sectors are among the most hazardous industries, accounting for around 200,000 deaths annually, which corresponds to 63% of all occupational accident-related fatalities (4).

Occupational accidents are injuries that can cause death and make the victims mentally or physically disabled. In addition to impairing the health of the employee, occupational accidents lead to loss of labour force; this situation causes financial burden in both health and business sectors. Emergency services are important centres for providing treatment to the victim, recording the accident, and making the first notification for investigation at the site of the accident after the occupational accident.

Patients admitted to the emergency department due to occupational accidents may be discharged at the emergency department or hospitalised. Factors such as age, gender, Glasgow Coma Scale value, injury locations of the patients may affect the process and cost of the health care in thehospital.

In patients admitted to hospital due to occupational accidents, even a minor trauma can cause serious physical disability and loss of labour force . Therefore, hospitalisation is required for the continuation of treatment and hospitalisation of these patients may be prolonged due to multiple trauma. This may increase the loss of labour force and the cost of treatment (5).

In this study, it was aimed to evaluate the demographic data and hospital costs of patients admitted to the emergency department due to occupational accidents.

METHODS

The study was conducted retrospectively in patients who were admitted to the Emergency Department of Mustafa Kemal University Hospital between 01.01.2020-31.12.2020 by 112 ambulance or who applied by their own means due to occupational accidents.

Using the hospital information management system, the information of patients treated in the emergency department (ED) was accessed. Patients admitted to hospital but without an occupational accident, patients who have an occupational accident but come to the hospital for control purposes and patients who come as a result of an occupational accident but are referred to another hospital or refuse treatment were excluded from the study. The remaining patients were included in the study and recorded in the database in which case information was processed by accessing the historical information of the patients from the hospital information management system, forensic forms, and patient information on the Ministry of Health. In this study, age groups, gender, hospitalisation-discharge status, number of days of hospitalisation and cost calculations of the patients were evaluated and entered into the database.

The data obtained from the forensic forms of the patients were analysed by dividing them into three categories as simple medical intervention required or not required and the presence of life-threatening conditions. In this examination, the guideline prepared for the evaluation of injuries defined in the Turkish Criminal Code was used

(6). All demographic, clinical data and treatments were recorded. Patients whose data could not be accessed were not included in the study.

The data were analysed using IBM 'Statistical Package for the Social Sciences' version 22 statistical analysis programme and the findings were analysed at a 95% confidence interval and 5% significance level.

In the evaluation of the data, number and percentage in categorical data and mean, standard deviation, median, minimum-maximum in numerical data were used as descriptive statistical methods. In the statistical analysis, firstly, whether the groups were suitable for normal distribution was examined by Kolmogorow Smirnow or Shapiro Wilks test. Student's T test and Mann Whitney U test will be used for the evaluation of numerical data and chi-square test will be used for the evaluation of categorical data. ANOVA and then Bartllet's test as a post-hoc test were applied for the comparison of numerical data including more than two groups. In the analyses performed, findings with a p value below 0.05 were considered significant.

RESULTS

150 patients were included in our study. Of these patients, 26 (17.33%) were female. The mean age of the patients was 36.5±10.4 years and Glasgow Coma Score was 15.

The most common cause of injury was incision (41 patients, 27.33%). Injury types and distribution according to gender are given in Table 1.

Table 1. Type of trauma and gender distribution

	Total	%	Female	Male	OR	p-value
Incision	41	27,33	1	40	0,084	0,0031
Blunt trauma	40	26,67	7	33	1,016	0,9741
Falling	34	22,67	5	29	0,78	0,6453
Foreign body penetration	23	15,33	10	13	5,337	0,0003
Chemical contact	5	3,33	1	4	1,2	0,8727
Burn	4	2,67	2	2	5,083	0,0802
Traffic accident	3	2,00	0	3	0	0,423

When the distribution of the patients according to triage, 79 (52.67%) patients received green triage code, while 71 (47.33%) patients received yellow triage code. In the comparison between genders, it was found that females received green triage code 10.78 times more frequently ($p<0.0001$, Table 2)..

Table 2. Triage distribution and gender comparison

Triage	n	%	Female	Male	OR	p-value
Green	79	52,67	24	55	15,05	<0,0001
Yellow	71	47,33	2	69		
Red	0	0,00	0	0	0	

When the injury sites of the cases were analysed, the most common injury site was found to be the upper extremity with 80 (53.33%) cases. The distribution of the cases according to the injury sites and genders are shown in Table 3. No significant difference was found in the comparison between genders.

Table 3. Injury site distribution and gender comparison

Location of Injury	n	%	Female	Male	OR	p-value
Upper extremity	80	53,33	13	67	0,8507	0,7079
Head	33	22,00	5	28	0,8163	0,7077
Lower extremity	29	19,33	5	24	0,9921	0,9884
Thorax	22	14,67	1	21	0,1962	0,0863
Neck	14	9,33	0	14	0	0,072
Abdomen	14	9,33	0	14	0	0,072
Pelvis	9	6,00	2	7	1,393	0,6894

In the comparison between the hospitalisation or emergency department admission of the patients after the injury, 145 (96.67%) patients were discharged after treatment in the emergency department, while 5 (3.33%) patients required follow-up in the emergency department.

Of these patients, 3 were followed up in the orthopaedics department, 1 in the plastic and reconstructive surgery department and 1 in the neurosurgery department. There was no significant difference between the outcome and gender of the patients.

The extent of post-injury treatment of the patients was compared. The number of patients who were treated with simple medical intervention was 122 (81.33%), while the number of patients who did not require simple medical intervention was 28 (18.67%). In the comparison between genders, the rate of injuries requiring simple medical intervention was 5.738 times higher in females (p=0.329).

Injuries of the patients were analysed according to months. The least number of injuries was observed in May with 7 (4.67%) patients.

When the relationship between the shifts of the employees and occupational accidents was analysed, the most common injury was observed in the shift between 8a.m.-4p.m. with 87 (58%) applicants.

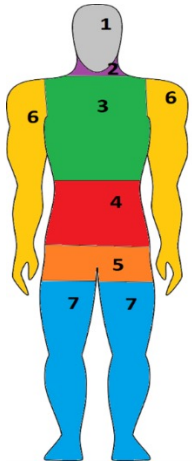
The mean cost of 150 patients was 16.7 ± 19.5 USD. When comparing genders, the mean cost for female patients ($6.96 ± 3.37) was significantly lower than that of male patients ($18.73 ± 20.81) (p = 0.0047).

In the comparison of discharge status and cost among accident victims, the mean cost for patients discharged from the emergency department was $15.13 ± 17.56, while the mean cost for those hospitalized in the ward was $62.07 ± 19.64. The mean cost of hospitalised patients was significantly higher (p<0.0001).

Comparison was made between the costs of the patients according to the trauma sites. A significant difference was found between the trauma sites (ANOVA, F=11.93, p<0.0001, Table 4). A significant difference was observed in the subgroup comparisons of the survivors (Figure 1.).

Table 4. Cost distribution according to site of injury

	1	2	3	4	5	6	7
	Head	Neck	Thorax	Abdomen	Pelvis	Upper extremity	Lower extremity
n	33	14	22	14	9	80	29
min	17,05	20,21	52,99	106,8	33,15	15,5	15,5
Max	853,4	853,4	853,4	853,4	853,4	591	547,2
Mean	203,1	335,7	268	371,7	283,7	90,25	109,8
SD	199,7	219,5	201,9	190,7	272,6	104,1	137,7



Group	p-value
1 ve 4	0,0246
1 ve 6	0,0178
2 ve 6	<0,0001
2 ve 7	0,0007
3 ve 6	0,0002
3 ve 7	0,0136
4 ve 6	<0,0001
4 ve 7	<0,0001
5 ve 6	0,0163

Figure1. Cost comparison by place of injury, ANOVA

DISCUSSION

Occupational accidents are situations that have significant effects worldwide, threatening both the physical integrity and life of individuals and resulting in loss of labour force. Increasing technological equipment brings speed in working life on the one hand and creates new hazards for injuries on the other hand (7).

In a retrospective study conducted by Karanfil et al. 6107 cases evaluated as occupational accidents between 2016 and 2020 were analysed. It was found that 186 of these cases were occupational accidents and they accounted for 1.26-3.8% of the annual admissions. Women constitute 8.06% of the patients (8).In a study published in 2019, the demographic distribution of occupational accidents occurring in our country was analysed. It was stated that 95.51% of all occupational accidents occurred in men (9).

According to EUROSTAT data, the ratio of women and men who had an accident was stated as 0.45. When the statistics in the literature are compared, there is a decrease in the amount of occupational accidents in our country and the United States in 2020, while an increase is observed in the European Union countries. Fatal occupational accidents in our country were reported as 3 per 1000 people, 1.8 per 1000 people in the United States and 1 per 1000 people in the European Union members. No fatal case was observed in our study. In our study, the female to male ratio was found to be 0.21, and it is seen that we are the country with the lowest rate of female injuries compared to the European Union countries. This situation can be characterised by the low level of female employment in our country.

While under 15 years of age and over 65 years of age were the least common occupational accidents, the mean age group in which occupational accidents were most common was found to be 25-34 (9). In a retrospective study conducted by Karanfil et al. the most common age group was found to be 36-45 years (8). The mean age found in our study was 36.5±10.4 years, whereas in analyses performed in our country, the most common age group for occupational accidents was found to be 25-34 years. The difference in this distribution was thought to be due to the fact that the hospital where the study was conducted was a tertiary health institution and the distribution could not be seen completely because it served selected patients.

A discrepancy in the incidence of accidents is observed between different occupational sectors.In a study conducted in France, work-related accidents occurring on the road were analysed. It was found that 9.9% of 105816 accidents occurring in drivers aged 14-64 years occurred during work and 18.6% occurred on the way to work (11). In a study conducted in industries working with cyclic working patterns, it was observed that 60% of occupational accidents occurred during the night shift and 57% occurred in the second half of the shift. On the basis of these two conditions, it was observed that the period of starting the day and cumulative fatigue came to the fore (12). In the study conducted by Ryu et al. occupational accidents between overtime workers and non-overtime workers were investigated. It was observed that working overtime posed a 1.7-2.7 times higher risk (13). In a study whose main objective was to investigate the relationship between occupational accidents and work types, a 12-month follow-up was performed. When the relationship between the types of work that caused occupational accidents during this period was analysed, it was observed that long working hours increased the probability of occupational accidents and shift work increased the risk of occupational accidents (Odds ratio: 1.54) compared to regular working hours (13). In another study conducted in Belgium, data between 2009 and 2011 were analysed. Workers without standard working hours reported more injuries than workers with standard working hours (14).

In a study conducted in our country, 287 occupational accident patients admitted to a tertiary emergency department were analysed. 103 of the patients were injured between 08-13 hours and 9 of them were injured between 20-08 hours. The most common time of injury was found to be the first hours of the day shift. When the hours of presentation to emergency department were analysed, the most common presentation time was found to be between 13 and 15 (16).In a retrospective study conducted in Izmir, the presentation seasons of the patients were examined. While the most common application period was observed as winter months with a rate of 39.3%, the least application was observed in summer months with a rate of 15.6% (8). In the study conducted by Acara in Izmir, it was reported that 46.5% of those who had occupational accidents worked in shifts. While 6.4% of these patients admitted to the ED were hospitalised in a clinic and followed up, 92.9% were discharged after treatment in the ED. It was found that

1.7% of the patients had a life-threatening injury. 1 of the accident victims resulted in excitus. Hand and arm injuries were observed in 6 of the hospitalised patients and tibia fracture was observed in one of them (16).

In our study, it was observed that 58% of the patients had occupational accidents between 08-16 hours. The highest proportion of applications was observed in winter months and the lowest application rate was observed in spring months. When compared with the studies in the literature, the most common shift in which injuries were observed was between 08-16 hours, which is the daytime working hours, and this was found to be compatible with other studies. While the most frequent application period was found to be winter months in accordance with other studies, the reason why the least application season was found to be different was thought to be due to the difference in regional work branches and work intensities in industrial types.

In a study conducted in Portugal where occupational accidents occurring in hospitals were investigated, it was seen that organisational factors played the most important role. The most common occupational accidents were needle sticks. Surgical applications and cleaning were found to be the most common places where this situation occurred. Apart from this, falls are the second most common occupational accidents. It occurs especially when entering different areas and while cleaning. Injuries resulting from incorrect force application and movement constitute the third most common accident group. This situation frequently occurs while carrying a patient or lifting something (17).

In the statement made by the United States, it was stated that 18% of occupational accidents in 2020 were related to falls and slips, these accidents were more common in employees younger than 25 years of age, 1.8 million employees applied to the emergency department due to these accidents and 66% of the applicants were male. It was emphasised that 16% were injured due to a collision with an object or a bruise caused by an object. It was stated that 3% of the accidents occurred in a land vehicle while being transported (18).

In the statistics shared by EUROSTAT on the causes of occupational accidents in European Union countries, it was stated that 18.6% of the employees were injured after slipping, falling or rolling. The rate of injury caused by equipment after loss of control of a machine is stated as 21.5 per cent. The rate of accidents resulting in physical stress of body parts was reported as 19.6%. 13.2% reported that there was no information about the mechanism of occurrence of occupational accidents (10).

When the causes of accidents in 287 occupational accident cases admitted to the emergency department of a tertiary healthcare institution in Izmir were analysed, it was observed that 21 patients fell from the same level, 17 patients were trapped under a falling object, 11 patients were crushed and 50 patients were injured with a sharp instrument. The working environment was stated as the most common factor as the cause of accident (16).

In a retrospective study conducted by Bahar et al. in a tertiary emergency department in Istanbul, 246 patients were analysed. It was found that 21.5% of the patients had penetrating sharp instrument injury, 23.2% had burns, 18.7% had fall from height, and 20% had traffic accidents. In the same study, 11.8% had cranial pathology, 4.4% had spinal trauma, 3.7% had thoracic involvement, 4.9% had abdominal pathology and 53.3% had extremity injury (18).

In the retrospective study conducted by Karanfil et al. the most common type of injury was found to be injury with sharp piercing instruments, while the least common type of injury was electric shock. The most common site of injury was the upper extremity and the second most common site of injury was the lower extremity. In 18 cases,

injuries were observed in the abdomen and 40 cases in the head and neck region (8).

It was found that 22% of the patients we analysed had head trauma, 53.33% had upper extremity trauma and 19.33% had lower extremity trauma. As seen in other studies in the literature, the most common occupational accidents were extremity traumas and this was found to be consistent with other studies.

In our study, incision was found to be the most common type of injury in the patients we followed up. The second most common type of injury was falls and the third most common type was trauma caused by foreign bodies. When the studies in the literature are analysed, it is seen that the most common cause of occupational accidents is injuries caused by piercing and cutting tools. The findings in our study and the findings in the literature were found to be compatible with each other.

In a study conducted in our country and analysing the occupational accidents between 2012-2020 according to the data of the Social Security Institution, the rate of occupational accidents in 2020 was determined as 384262 people. Mortality was observed in 1231 of these people. As of 2012, the number of occupational accidents that increased as of 2018 was observed in a downward trend after 2018, and although a lower rate of occupational accidents was observed in 2020 compared to the previous year, the number of fatal occupational accidents increased compared to 2019 and decreased compared to 2018 (20). In another study conducted in our country, excitus was observed in 2% of the harvests followed up (19).

In the labour statistics announced by the United States, the rate of occupational accidents in 2020 was reported as 2.7 million, while it was stated that it decreased by 5.7% compared to 2019. While the number of fatal occupational accidents in 2020 was announced as 4764, this amount decreased by 10% compared to 2019 (18).

In the statistics of the European Union countries announced by EUROSTAT, it was stated that there were 3.1 million non-fatal accidents and 3408 fatal accidents. In 2020, it was emphasised that the number of occupational accidents increased compared to 2019 (10).

Of the patients we followed up, 96.75% were discharged from the emergency department, and 3.33% had injuries that required follow-up in the ward. No injury with mortality was found in the patients followed up. In studies in the literature, the average mortality rate was found to be 0.1%, and the incidence of mortality in women was observed to be less frequent than in men. Our findings were not found to be compatible with the literature, and the main reason for this was the fact that mortal cases were not seen in the follow-up period due to the fact that occupational accidents occurring in the region were also followed up by other hospitals.

In the study conducted by Bahar et al. the most frequently consulted unit was orthopaedics with a rate of 6.5% due to impingement with objects and plastic and reconstructive surgery with a rate of 11% due to injuries with piercing and cutting instruments (19).

In a retrospective study performed on patients in the Forensic Medicine unit, it was observed that 76.3% of the patients had an injury that could not be treated with simple medical intervention, while 28.5% had a life-threatening injury (8).

Evaluation of forensic cases admitted to the emergency department and correct reporting are important for the expert witness duty of the physician. In a study conducted 6% of male patients who were forensic cases were occupational accidents, while this rate was 0.8% in female patients (21).

Of the patients we analysed, 96.67% were discharged

from the emergency department. Hospitalised follow-up was required in 3.33% of the patients. While 81.33% of the patients had a trauma that could be resolved with simple medical intervention, no excitus was observed. As seen in the studies in the literature, the majority of the patients were treated in the emergency department and discharged. While more simple medical intervention was observed in the patients followed up in our study compared to the other study, the main reason for the absence of a life-threatening situation is thought to be the difference in regional workplaces.

An important part of industrial production is the balance of income and expenses. Occupational accidents and occupational diseases are seen as an important parameter for these expenses. In sectoral comparisons, the greatest decrease in income is observed after accidents occurring in the construction sector (22).

After upper extremity injuries in patients, their return to employment is delayed. In addition, while compensation and reimbursements, which are among the expense items, increase, poor prognostic results are observed in the recovery period due to the heavy workload (23). In our study, the most common site of injury was the upper extremity with 80 (53.3%) patients. The mean health costs of the individuals were found to be 30.25±104.1.

The loss that occurs because individuals do not go to the workplace and participate in production or service due to occupational accidents and occupational diseases is called loss of working days (24). Working day loss, which is one of the parameters used in the evaluation of occupational accidents, is calculated over the total lost days in the working year for the insured worker. In a study conducted in our country, Social Security Institution data between 2012 and 2020 were analysed and comparisons were made between sectors. It was observed that the frequency of occupational accidents increased between the years, and the rate decreased with working from home during the pandemic period. In our country, while the number of temporary incapacity days in 2019 was 3627934 days, the number of permanent incapacity days was 123623 and the number of fatal accidents was 1147, in 2020, this number was observed as 3492824 temporary incapacity days and 98620 permanent incapacity days, and the number of fatal cases was 1231. According to the total number of occupational accidents, the number of lost days per person was observed as 8.58 days in 2019 and 9.08 days in 2020 (20).

In a retrospective study conducted in our country, the costs of occupational and occupational diseases occurring between 2005 and 2013 were evaluated in the analysis. The relationship between the data obtained in this period and the economic burden of the country was analysed. It was observed that 12617 people lost their lives in 990587 occupational accidents evaluated in the period. It was determined that 582774 days of these people were spent in hospital with follow-up, a total of 18464857 working days were lost and this situation was 67,887 billion TL which corresponds to approximately 50.27 billion USD based on the 2005-2013 average exchange rate of 1.35 TL/USD. The average exchange rate for the 2005–2013 period is approximately 1 USD = 1.35 TL (taking into account the exchange rate fluctuations during the period)(1). The average equivalent of this rate per person is 68532 TL which corresponds to approximately 50,824 USD (24).

In a study conducted by Koç et al. it is emphasised that when the Gross National Product of our country in 2010 is taken into consideration as 1.1 trillion TL $709.68 billion based on the 2010 average exchange rate of 1.55 TL/USD, it constitutes an expense of 44 billion TL which corresponds to approximately $28.39 billion(1). In 2010, a health deficit of 26.7 billion TL which corresponds to approximately $17.21 billion was realised by the Social Security Institution and a 1.5-fold burden occurred in the national economy. This

cost consists of treatment, incapacity allowance, funeral expenses and payments in the following period. In 2009, the number of individuals with permanent incapacity for work after occupational accidents in our country was 1668, while the number of deaths was 1171. In the treatment process, the number of working days lost with outpatient treatment was 1520563 days, while the number of days lost with inpatient treatment was 13186 (25).

In a study conducted by Carlos-Rivera et al. in 2009, the injury rate of employees was reported as 2.9%. The average medical expense was reported as 20959 US dollars. This rate constitutes 1% of health expenses for Mexico (26). In the examination conducted in our country, it was observed that occupational accidents between 2012-2020 covered 10% of the total premium days (20). The total number of active insured individuals in our country in 2021 is 24745149 people (27).

In a study published by Waehrer et al. in 2005, it was reported that 52% of the expenses in occupational accident studies were spent in hospitals, 32% in post-hospital treatment care and 6% in home care services. Occupational accidents constitute the third most important expenditure parameter in the healthcare system with an expenditure of 313 US dollars per incident (28).

A study published in BMC Public Health in 2025 on high-risk sectors in China revealed that occupational accidents and occupational diseases are inversely proportional to the country's economic growth. For every increase of 0.461 trillion CNY in GDP, the number of deaths resulting from production safety accidents decreases(29).

In a study published by Topcu at all in 2024 examining the impact of workplace accidents on operational costs in Turkey's aviation sector found that increasing occupational health and safety expenditures could reduce the number of accidents. The findings suggest that insufficient investment in safety measures may increase the likelihood of accidents by approximately 84 times(30).

The data presented in the studies clearly demonstrate that investments in occupational safety significantly reduce the number of fatalities resulting from occupational accidents.

In our study, the minimum cost of the patients was $2.21, the maximum cost was found to be $121.91 and the mean cost was $16.69. It was observed that the need for inpatient follow-up, being male, and having wounds that could not be treated with simple medical intervention significantly increased the cost.

When analysed according to the site of trauma, the highest cost was $53.10 in abdominal trauma, followed by neck trauma with a mean cost of $47.96.

In the evaluations in the literature, it was observed that 52% of the costs incurred in occupational accidents were related to hospital treatment, and it was reported to vary between 313 US dollars and 20959 US dollars. It is thought that there are two main reasons for the discrepancy observed between the data in the literature and our study; the first one is the years in which the evaluations were made and the second one is the differences between the health policies of the countries.

Limitations

This study was conducted in 2020, when activities in the industrial business lines were slowed down due to the covid 19 pandemic that affected the whole world. Therefore, occupational accidents in these lines of business may be seen to be relatively less. For this limitation, the study period could have been kept longer.

Occupational accidents occurring within the hospital could also be excluded from the study as they were referred to the emergency department and generally required simple medical intervention.

This study could have been carried out in a multi-centre

in the same province to avoid being affected too much by the distance to the industrial zone.

CONCLUSION

It was observed that males were more frequently affected by occupational accidents and traumas were seen in the adult age group. %). The most common injury occurred between 8 am-4pm hours, which is the first shift of the day and the most important cost among traumas occurred due to abdominal injuries. Measures should be taken to prevent injuries and trainings should be increased. We believe that this will be effective in reducing morbidity, mortality and cost.

Declarations

Conflict of Interest

The authors declare that they have no conflict of interest related to this article.

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