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Earthquake Victim Profile in a Hospital Far from the Earthquake Zone: The Case of Sakarya

Deprem Bölgesinden Uzaktaki Bir Hastaneye Başvuran Depremzede Hasta Profili: Sakarya İli Örneği

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ABSTRACT

Objective: In our study, the effect of earthquake victims who applied to the emergency department (ED) of our hospital, despite being far from the earthquake area, on the workload and the need for additional precautions will be examined. As a result, it is aimed to create a guiding resource for future disasters.

Materials and Methods: This study was conducted with patients who applied to Sakarya Training and Research Hospital (STRH) Emergency Department within 15 days after the Kahramanmaraş earthquake and were diagnosed as X34-Earthquake Victims according to ICD-10.

Results: The mean age of the 405 patients were 20.98 years, and 52.6% were female. The ratio of the admitted patients to the total number of patients was 1.62%. Regarding resource use, the laboratory was requested for 32.3%, imaging examination for 55.1%, consultation for 19%, and 353 patients were discharged from the emergency department.

Conclusion: Although earthquake victims may apply to the emergency departments regardless of the distance after the earthquake, this number is insufficient to require additional measures regarding the workload it creates. However, since this study is the first analysis based on distance, it should be supported by similar studies.

Keywords: Earthquake, emergency department, precaution

ÖZ

Amaç: Bu çalışmada deprem bölgesinden uzakta olmasına karşın hastanemiz acil servislerine başvuran depremzedelerin acil servis iş yüküne etkisi ve ek bir önlem alınmasının gerekip gerekmediği yönünden analiz edilerek gelecekteki olası afetler için güncel bir kaynağın oluşturulması amaçlanmıştır.

Materyal ve Metot: Bu çalışma; Kahramanmaraş depremi sonrası ilk 15 günlük süreçte Sakarya Eğitim ve Araştırma Hastanesi (SEAH) acil servislerine başvuran ve Uluslararası Hastalık Sınıflandırması-10'a göre X34-Depremzede tanısı almış tüm hastaları içermektedir.

Bulgular: Çalışmaya dahil edilen toplam 405 hastanın yaş ortalamaları 20,98 yıl ve %52,6'sının ise kadın olduğu saptandı. Depremzede hastaların, toplam acil servis başvuru sayısına oranı % 1,62 olduğu gözlendi. Kaynak kullanımı bakımından %32,3'üne en az bir laboratuvar istemi yapıldığı, %55,1'ine en az bir görüntüleme tetkiki istendiği, %19'una konsültasyon istendiği ve 353 hastanın ise direkt acil servisten taburcu edildiği tespit edildi.

Sonuç: Deprem sonrası mesafeden bağımsız acil servislere depremzede başvurusu olabilmesine karşın bu sayı oluşturduğu iş yükü bakımından ek bir önlem almayı gerektirecek kadar fazla değildir. Ancak bu çalışmanın, mesafe dikkate alınarak yapılan ilk analiz olmasından dolayı benzer çalışmalar ile desteklenmesi gerekmektedir.

Anahtar Kelimeler: Acil servis, deprem, önlem

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INTRODUCTION

Earthquakes are natural disasters that cause death and significant loss of property due to seismic fluctuations caused by the energies in the earth's crust shaking the earth.[1] Turkey has active fault lines, and large-scale earthquakes occur regularly. Among the last century's earthquakes, one that caused the most death and property loss occurred in Kahramanmaraş on February 6, 2023 (Epicenter: Pazarcık district; Intensity: 7.7 Mw; Focal depth: 8.6 km). The fact that a second earthquake occurred approximately nine hours after the first earthquake (Epic Base: Elbistan district; Intensity: 7.6 Mw; Focal depth: 7 km), makes these earthquakes unique due to the size of the area and the large number of people affected.[2] More than 13.5 million people in 11 provinces (Kahramanmaraş, Gaziantep, Şanlıurfa, Diyarbakır, Adana, Adıyaman, Osmaniye, Hatay, Kilis, Malatya and Elazığ) and an area of 108,812 km2 were affected by these earthquakes.[2,3]

The first days after an earthquake are critical for rescue activities and health services.[4] According to the information published by the official authorities, 42 310 people lost their lives, 108 281 people were injured, 21 859 injured people were treated, and 51 152 people were transferred to hospitals in other cities due to the earthquake in the first 15 days.[5,6] According to this information, it is understood that health services outside the earthquake zone should also be regulated. As a matter of fact, despite being far from the earthquake area, earthquake victims applied to our hospital. However, no study in the literature investigates the relationship between earthquake victims and the distance to the earthquake zone.

In our study, the effect of earthquake victims who applied to the emergency departments (ED) of our hospital, despite being far from the earthquake area, on the workload and the need for additional precautions will be examined. As a result, it is aimed to create a guiding resource for future disasters.

MATERIALS AND METHODS

Ethical Approvals and Permissions: Approval for this study was obtained from the Sakarya University Faculty of Medicine Ethics Committee (Date: 27.02.2023, decision no: 61). The procedures were carried out by the 2004 Declaration of Helsinki.

Research Type: This study is a descriptive, cross-sectional, and retrospective study conducted between February 6 and February 20, 2023. Patients who applied to STRH Emergency Departments (Adults, Gynecology and Obstetrics, Child) and were diagnosed as X34-Earthquake Victims according to the International Classification of Diseases-10 were included in the study.

Definitions: Our tertiary hospital provides emergency departments in three different areas (Adults, Gynecology and Obstetrics, and Pediatrics). The annual number of applications is 739,776, and the total number of applications during the education period is 25.061. The approximate distance from the epicentre of the earthquake is 900 km.

Inclusion Criteria: All patients who applied within the first 15 days after the earthquake were diagnosed as X34-Earthquake Victims. Patients whose data can be fully accessed through the hospital automation system were included in the study.

Exclusion Criteria: Patients whose data cannot be accessed through the hospital automation system

Data Collecting: In the study, the patients; demographic characteristics (age, gender), the emergency department applied (Adult, Gynecology and Obstetrics, Child), whether there is an earthquake-related injury, affected area if there is an injury (head/neck, thorax, abdomen, pelvis, extremity, multiple injuries in case of injuries involving two or more regions), resource use (laboratory examination, ultrasonography, tomography, consultation request) and emergency room outcomes (discharge, service or intensive care admission) were recorded using the hospital automation system.

Statistical Analysis: IBM SPSS Statistics (Version 21.0. Armonk, NY: IBM Corp.) was used for statistical analysis. Kolmogorov-Smirnov ($n \geq 50$) test was performed in the normality analysis of numerical data. Numerical variables were expressed as the average, along with the standard deviation. The chi-square test presented as numbers and percentages were used for categorical variables.

RESULTS

After the Kahramanmaraş earthquake, the information regarding the applications made to the STRH Adult, Gynecology and Obstetrics and Pediatric EDs between 6-20 February 2023 is shown in Table 1. Accordingly, most applications were to the Pediatric ED. When applications on a unit basis are compared according to the total number of patients, the rates were found to be 0.89% in the Adult ED, 2.17% in Gynecology and Obstetrics ED, 3.2% in the Pediatric ED, and 1.62% in total.

The demographic characteristics of the patients, whether laboratory, imaging, and consultation, were requested, and the emergency department outcomes are shown in Table 2. It was determined that the mean age of the patients was 20.98 years, 52.6% were female, 32.3% were requested to be in the laboratory, 55.1% were imaging tests, 19% were consulted, and 353 people whose treatment was completed during the emergency department were discharged. It was observed that laboratory, imaging,

Table 1. Applications to adult, gynecology and obstetrics, and pediatric emergency departments.

ED	Earthquake Victim n (%)	Earthquake-Related Injury (%)	Total n (%)
Adult ED	148 (0.89)	118 (0.71)	16608 (100)
Pediatric ED	221 (3.2)	4 (0.05)	6799 (100)
GOED	36 (2.17)	0 (0)	1654 (100)
Total	405 (1.62)	122 (0.48)	25061 (100)

ED: Emergency Department; GOED: Gynecology and Obstetrics Emergency Department.

Table 2. Demographic characteristics of patients, resource use, emergency room outcome, and earthquake-related injuries.

		Adult (n: 148)	Gynecology and Obstetrics (n: 36)	Pediatric (n: 221)	Total (n: 405)
Age (years)		42.45	27.61	5.52	20.98
Gender	Female, n (%)	78 (52.7)	36 (100)	99 (44.8)	213 (52.6)
	Male, n (%)	70 (47.3)	0 (0)	122 (55.2)	192 (47.4)
Laboratory	Request, n (%)	68 (45.9)	6 (16.7)	57 (25.8)	131 (32.3)
	Not request, n (%)	80 (54.1)	30 (83.3)	164 (74.2)	274 (67.7)
Scanning	Request, n (%)	125 (84.5)	33 (91.7)	65 (29.4)	223 (55.1)
	Not request n (%)	23 (15.5)	3 (8.3)	156 (70.6)	182 (44.9)
Consultation	Request, n (%)	67 (45.3)	0 (0)	10 (4.5)	77 (19.0)
	Not request, n (%)	81 (54.7)	36 (100)	211 (95.5)	328 (81.0)
Outcome	Discharge, n (%)	121 (81.8)	28 (77.8)	204 (92.3)	353 (87.2)
	Standart room, n (%)	22 (14.9)	8 (22.2)	17 (7.7)	47 (11.6)
	Intensive care unit, n (%)	5 (3.4)	0 (0)	0 (0)	5 (1.2)
Earthquake-related injury	Having, n (%)	118 (79.7)	0 (0)	4 (1.8)	122 (30.1)
	Not having, n (%)	30 (20.3)	36 (100)	217 (98.2)	283 (69.9)

Table 3. Distribution of injuries to the lesion areas.

	Head/Neck n(%)	Thorax n(%)	Abdomen n(%)	Pelvis n(%)	Extremity n(%)	Multiple n(%)	Total n(%)
Lesion Area	24 (20)	16 (13)	2 (2)	9 (7)	60 (49)	11 (9)	122 (100)

and consultation requests were mostly requested from the adult emergency department. It was found that the patients who applied to the Gynecology and Obstetrics Emergency Department did not request a consultation.

A total of 122 patients with earthquake-related injuries came to the emergency department, and the majority (n: 118; 96.7%) applied to the Adult Emergency Department. (Table 2). Data on the affected areas after injury are shown in Table 3. It was observed that the extremities (60.49%) were affected the most, and the abdomen (2.20%) was the least affected.

DISCUSSION AND CONCLUSION

Natural disasters have caused deaths and property losses all over the world throughout history.[7] Earthquakes stand out among these disasters regarding death, disability, and economic loss.[8] It has been reported that 125 million people were affected by earthquakes in the past 20 years, and approximately 750.000 people died.[9]

Health services were most affected by the earthquake; the most affected unit among health services is the emergency service. Especially in the first days after the earthquake, a density is expected due to the applications of earthquake victims. When we look at the publications on this subject, there is information that the rate of earthquake victims who applied to the emergency service after the earthquake was 75% and above in the first days.[8,10,11] Studies on this subject report that most hospital admissions are made within the first 1-2 days after the earthquake.[10,12] In our study, it is observed that there were no earthquake victims in the first 48 hours. This may have resulted from the response to the earthquake and its distance from the earthquake zone. In addition, when we look at the applications of the earthquake victims in the first 15 days, only 405 patients were identified, and this number corresponds to only 1.62% compared to the number of applications made in the same period, which is at a level that can be neglected when similar studies are examined.

In studies conducted on patients who came to the emergency department after an earthquake, it is seen that the number of discharges and hospitalisations is high.[8,10] Publications on the use of resources are limited in number. One study reported that 72.3% of the earthquake victims who came to the emergency department did not need any laboratory examination, and 12.2% did not need any imaging examination.[10] Our results support this study. An important reason for this situation may be that most earthquake victims were slightly injured. It has been reported in different studies that most of those who applied to the emergency department after a disaster had minor injuries.[12-14]

Our study revealed that only 52 (12.8%) of earthquake victims were hospitalised. It is seen that this figure corresponds to a rate of only 3.42% when compared to the hospitalizations from the emergency departments in the same period. In a study examining the post2020 Izmir earthquake, the subject reported that 85% of the patients were discharged after ED follow-up, 7% were hospitalized in the standard room, and 2% were hospitalized in intensive care.[10] Similarly, in another study examining the 2011 Van earthquake, it was reported that 72% of the earthquake victims were discharged after ED follow-up, 9% were referred to another hospital, and 19% were admitted to the standard room or intensive care unit.[8] Our study results were compatible with the literature, and 87.2% of the patients were discharged. All these results support the idea that after the earthquake, injuries that can be discharged (superficial injuries that are not of vital importance) are more prominent, especially in earthquake victims, rather than hospitalization.

General body injuries constitute an essential part of post-earthquake emergency services. The literature shows that most injuries occur in the extremities with a rate of 35-40%, and the lower extremities are the most common among extremities.[10,11,15] However, there are also many studies in which other systems, significantly the head/neck, and thorax, can be affected.[10,15,16] Our study results are consistent with the literature, and the number of patients admitted due to injury was approximately 30%, and isolated extremity trauma was 60.49%.

In conclusion, although earthquake victims may apply to the emergency departments regardless of the distance after the earthquake, this number is insufficient to require additional measures regarding the workload it creates. However, since this study is the first analysis based on distance, it should be supported by similar studies. The limitations of our study are; the distance of our city to the earthquake zone, being the only center of the study, and patients coming with their own will and means.

Ethics Committee Approval: Approval was obtained from the Non-Invasive Ethics Committee of Sakarya University Faculty of Medicine (Date:27.02.2023 and decision no: 61).

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – NA; Supervision – NA, YY, BE, OK, FG; Materials –NA, SA, YY; Data Collection and Processing –NA, BE, FG, OK; Analysis and Interpretation – SA, NA, YY; Writing – NA, YY, SA.

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