

# A dangerous tradition: retrospective analysis of celebratory gunfire-related injuries in three tertiary hospitals

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## ABSTRACT

**BACKGROUND:** Firing guns into the air during celebrations is a tradition that poses significant risks to public safety. These falling bullets, often referred to as tired bullets, can attain high velocities during their descent and have the potential to cause serious injury or death to people and animals, or significant damage to property upon impact.

**METHODS:** This study aimed to retrospectively detect and analyze incidents of celebratory gunfire-related injuries (CGRI) that were admitted to three different hospitals in two cities in Turkey over a 10-year period from 2014 to 2023.

**RESULTS:** Data collected from Trabzon Kanuni Training and Research Hospital, Karadeniz Technical University Faculty of Medicine Farabi Hospital, and Yeditepe University Kozyatağı Hospital revealed 48 cases of injuries attributed to celebratory gunfire. Of these cases, 64.6% involved male victims. Children aged 0-17 years were the most affected demographic, with the head, neck, and face being the most frequently injured areas. The majority of incidents occurred in rural areas. Eight cases (16.7%) resulted in fatalities. The reasons for gunfire in 43.8% of the cases could not be determined.

**CONCLUSION:** Sociologically, gun ownership is often associated with prestige and can trigger the use of firearms in celebrations, such as weddings, in some societies. However, this tradition can result in tragic consequences worldwide. Stricter regulations and legal frameworks are necessary to prevent the use of unlicensed weapons. Collaborative efforts are crucial for effectively addressing the societal normalization of celebratory gunfire. Future prospective studies can comprehensively evaluate the incidence of CGRI and identify effective preventive strategies to safeguard public health.

**Keywords:** Firearm injuries; public health; public safety; tired bullet.

## INTRODUCTION

Celebratory gunfire is the practice of discharging firearms into the air in celebration of an event or occasion, such as weddings, holidays, soldier send-offs, or sporting victories. Although it may be perceived as a cultural or traditional expression of joy in certain regions, it significantly endangers public

safety. The bullets that are fired skyward eventually lose their upward momentum, and gravity causes them to return to the ground. These falling bullets can reach high velocities and have the potential to cause serious injuries or fatalities if they strike a person, animal, or property.<sup>[1]</sup> Injuries resulting from this practice are often referred to as tired bullet injuries or falling bullet injuries.

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In 2021, nearly 49,000 deaths in the United States were related to firearms.<sup>[2]</sup> The proportion of these deaths attributable to celebratory gunfire is unclear. "What goes up, must come down" is an old saying. There have been numerous instances where celebratory gunfire has led to injuries or fatalities, despite the lack of intent to cause harm by the individuals engaging in it. Regrettably, accidents resulting from celebratory gunfire have been reported in various regions, including the Middle East, the United States, Latin America, South Asia, Russia, and North Africa.<sup>[3-13]</sup>

The purpose of this study is to identify incidents of celebratory gunfire-related injuries (CGRI) and examine the consequences of such injuries treated at three different hospitals in two cities of Türkiye over a 10-year period from 2014 to 2023.

## MATERIALS AND METHODS

### Study Design and Setting

This investigation was a multicenter, retrospective analysis conducted at the Trabzon Kanuni Training and Research Hospital, Karadeniz Technical University Faculty of Medicine Farabi Hospital, and Yeditepe University Kozyatağı Hospital.

### Ethical Approval and Patient Consent

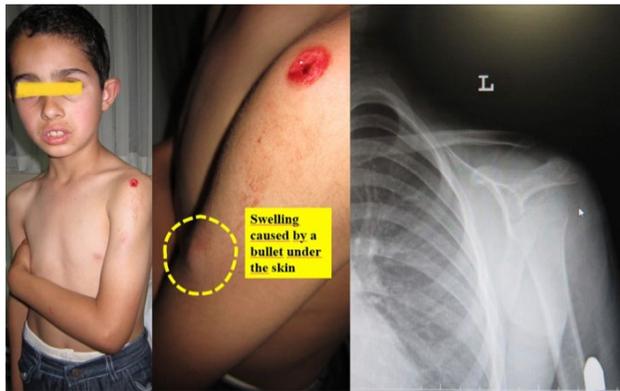
This study was conducted following approval from the Health Sciences University, Trabzon Faculty of Medicine (No: 2024/01). Due to its retrospective nature and the use of hospital records, written consent from participants was not required.

### Data Collection

CGRI cases presenting to the emergency department from January 1, 2014, to December 31, 2023, were included in the study. Patients assigned International Classification of Diseases (ICD) codes and subcodes for firearm injuries and presented to the emergency department within the specified timeframe were identified from hospital databases. Cases were also identified through keyword searches in electronic patient records (including history, consultation, and clinical course) as related to CGRI. Additionally, news websites and newspaper archives were searched using the keywords "yorgun mermi" and "Maganda kurşunu" along with Trabzon and İstanbul on Google.com. "Yorgun mermi" and "Maganda kurşunu" are Turkish terms synonymous with celebratory gunfire. Names of individuals from news reports on deaths or injuries related to CGRI were matched with hospital records based on the incident date, and matching cases were included in the study. Patient demographics, such as age, gender, time of admission, incident location, reason for firearm discharge, and patient outcomes, were documented in Microsoft Excel. Patients found in the google.com database but not registered in the hospital database were excluded from the study.

**Table 1.** Demographic data of celebratory gunfire-related injuries

Parameters	N (%)
Gender	
Men	31 (64.6)
Women	17 (35.4)
Age	
0-17 Child	19 (39.6)
18-45 Young	16 (33.3)
46-65 Middle Age	9 (18.8)
>65 Old	4 (8.3)
Year	
2016	3 (6.3)
2018	2 (4.2)
2019	11 (22.9)
2020	4 (8.3)
2021	12 (25)
2022	5 (10.4)
2023	11 (22.9)
Month	
January	1 (2.1)
March	4 (8.39)
June	6 (12.59)
July	12 (25)
August	15 (31.39)
September	4 (8.3)
October	4 (8.3)
December	2 (4.2)
Anatomic Distribution	
Head-Neck-Face	19 (39.6)
Thorax	6 (12.5)
Abdomen	1 (2.1)
Upper Extremity	9 (18.8)
Lower Extremity	13 (27.1)
Outcome	
Injured	40 (83.3)
Dead	8 (16.7)
Incident Area	
Rural	42 (87.5)
City	6 (12.5)
Circumstance	
Soldier Send-Off	1 (2.1)
Wedding	14 (29.2)
Arbitrarily Firing	12 (25)
Unknown	21 (43.8)
City	
Trabzon	31 (64.6)
İstanbul	17 (35.4)



**Figure 1.** According to relatives, an 8-year-old boy, injured by celebratory gunfire at a wedding ceremony, was taken to the hospital with complaints resembling insect bites. (Courtesy of M. F. Celikmen).

### Statistical Analysis

Statistical analyses were carried out using the Statistical Package for the Social Sciences (SPSS) for Windows, version 23.0 (IBM Corp., Armonk, NY, USA). The Kolmogorov-Smirnov test was employed to assess the normality of data distribution. Frequency data were presented as numbers and percentages. Ordinal data were expressed as mean  $\pm$  standard deviation and min-max.

## RESULTS

In this study, we analyzed the emergency service records from three different hospitals in the cities of Trabzon and Istanbul over the 10-year period from 2014 to 2023. A total of 48 cases of CGRI were identified. Among these cases, 31 (64.6%) were male, and 17 (35.4%) were female. The majority of cases involved children aged 0-17 years, with the head-neck-face region being the most common site of injury in 19 cases (39.6%). All patients presented with single wounds.

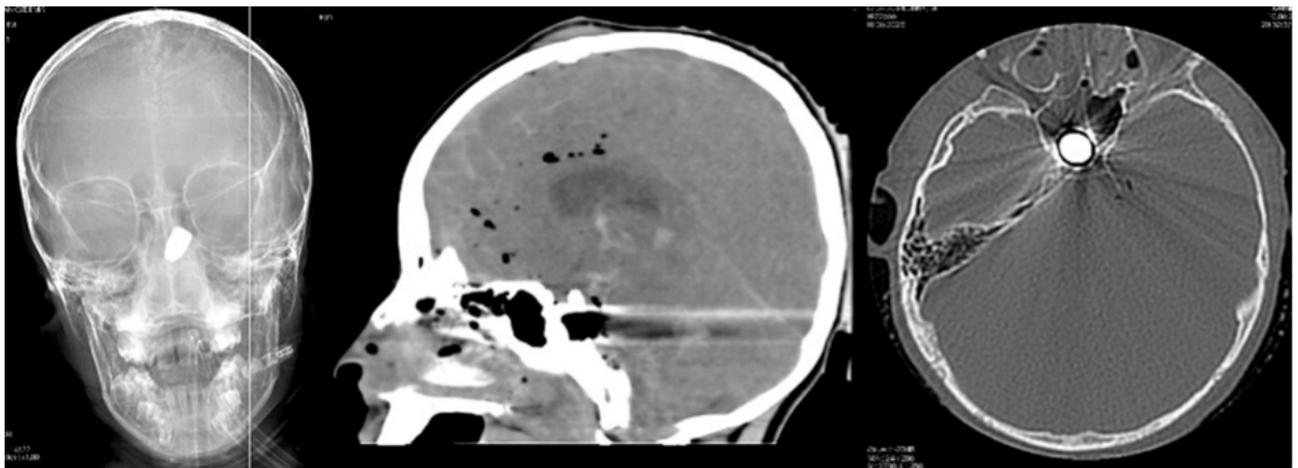
As a result of the injuries, 8 cases (16.7%) resulted in death, and it was found that 42 incidents (87.5%) occurred in rural areas. The incidents were more frequent in June, July, and August compared to other months. The circumstances of the gunfire could not be determined in the majority of cases (21 cases, 43.8%). All fatalities from CGRI were due to injuries in the head-neck-face area. The descriptive data of the study on CGRI is presented in Table 1.

## DISCUSSION

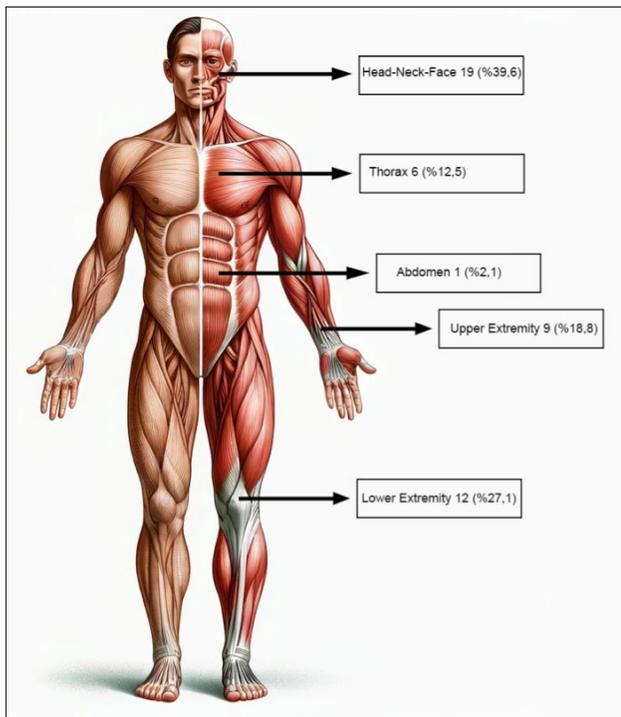
This study examined CGRI cases presenting to the emergency department over a 10-year period at three different tertiary hospitals. We observed that men are most frequently injured, while children are notably vulnerable, and such injuries are predominantly recorded during the summer months (June, July, and August). The most common site of injury is the head-neck-face area, with a significant number of incidents occurring in rural areas. The reason for discharging firearms is unknown in most instances, and the mortality rate is considerable.

From a sociological standpoint, gun ownership is still perceived as a privilege and a symbol of prestige, especially in rural and culturally rural urban areas. Firing shots into the air, particularly during weddings, is intended to convey the message that the host family has the means to protect their life, honor, and property. This practice, prevalent in rural segments of society, has been influenced by individuals with personality disorders leading to reckless events. Those with immature personalities often engage in such displays to assert their adulthood and compensate for deficiencies in professional achievements, wealth, appearance, and other perceived shortcomings.

When examining epidemiological data on firearm injuries, it is observed that these incidents most frequently affect child and young adults.<sup>[14]</sup> A similar pattern is noted in cases of CGRI, with a tragic emphasis on children suffering more injuries than



**Figure 2.** A 9-year-old male patient was admitted to the hospital after experiencing sudden syncope while playing in a park. Upon examination, an entry wound was detected at the vertex of the cranium. A head CT scan revealed the bullet core near the sphenoid sinus. (Courtesy of M. Imamoglu).



**Figure 3.** The anatomic distribution of celebratory gunfire-related injuries shows that injuries to the head-neck-face region were the most common. (Courtesy of M. Cicek).

young adults, particularly during the summer months. The cessation of the school year and increased outdoor activities during this season may lead to this heightened risk (Fig. 1).

Upon reviewing the 2022 statistics from the Turkish Statistical Institute regarding marriages and divorces, it is apparent that the frequency of marriages in June, July, and August significantly exceeds that of other months. The rise in weddings, celebrations, and excursions to highlands and villages (where transportation is challenging in the winter months), along with increased tourism activities during the summer, may augment the likelihood of celebratory gunfire. This trend is a significant factor in the surge of CGRI cases during the summer.

The literature contains numerous articles on the terminal velocity of bullets fired into the air and their potential to inflict harm upon the human body.<sup>[1]</sup> It is widely acknowledged that spent bullets can retain sufficient velocity and energy to fracture skulls and long bones (Fig. 2). Our research indicates that all fatalities from CGRI stemmed from injuries to the head-neck-face area, which also emerged as the most common injury type (Fig. 3). Ordog et al., in their research conducted at King/Drew Medical Center in Los Angeles from 1985 to 1992, found head injuries accounted for 77% of cases.<sup>[15]</sup> Many studies corroborate the finding that CGRI-related injuries predominantly affect the head-neck-face region, likely due to increased outdoors presence and the greater probability of bullets descending freely from the sky striking the head area.

In our study, when the reason for firearm discharge could

be identified in CGRI cases, the most common reason was guns being fired at weddings. There are studies in literature that report similar results.<sup>[16]</sup> Regrettably, the practice of using firearms for celebratory purposes by civilians at weddings and similar events is widespread globally. Annually, more than 200,000 individuals succumb to gun violence, with approximately 150,000 homicides, over 65,000 suicides via firearms, and more than 20,000 fatal gun accidents.<sup>[17]</sup> Civilians are estimated to possess about 85% of the over 1 billion small and light firearms globally.<sup>[17]</sup> The widespread use of firearms, particularly the continuance of unauthorized firearm usage as a tradition, is one of the primary reasons for discharging guns into the air during celebrations. Türkiye ranks 14th globally in terms of individual firearm ownership, and incidents involving unauthorized firearms occur six times more frequently than those with licensed firearms.<sup>[18]</sup> In our research, the purpose of firearm discharge could not be determined in 43.8% of the incidents. The primary challenge in obtaining information after ballistic analysis of the retrieved bullet core stems from the prevalence of unauthorized firearm usage. Enhancing firearm license scrutiny, enforcing stricter controls on bullet sales, intensifying law enforcement checks during the summer, sporting events, soldier send-offs, etc., and revising punitive measures for detecting unauthorized firearm usage could help alter this societal norm.

This study examines CGRI cases admitted to three tertiary hospitals. The absence of a specific ICD code for these injuries and the study's retrospective nature may have limited some data availability. Moreover, since the research was based on data from three different hospitals in two cities, the findings may not fully represent the situations in these locations.

## CONCLUSION

This study documented celebratory gunfire-related injuries (CGRI) identified in three different tertiary care hospitals over a decade. It represents compelling evidence that celebratory gunfire poses a significant threat to individuals, leading to severe injuries and even fatalities. Preventative measures should include raising public awareness, enhancing community vigilance, regulating individual firearm possession, and enforcing penalties for uncontrolled firing in residential areas. Moreover, healthcare professionals need to be aware of the potential for injuries caused by stray bullets, especially in patients presenting with altered consciousness or unexplained sudden injuries from areas known for celebrations or demonstrations.

**Ethics Committee Approval:** This study was approved by the Trabzon Faculty of Medicine Ethics Committee (Date: 16.01.2024, Decision No: 2024/40).

**Peer-review:** Externally peer-reviewed.

**Authorship Contributions:** Concept: M.F.Ç., M.Ç.; Design: M.F.Ç., M.Ç.; Supervision: M.F.Ç., M.Ç., M.İ., V.T.; Resource: M.F.Ç., M.Ç., M.İ., V.T.; Materials: M.F.Ç., M.Ç., M.İ.,

V.T.; Data collection and/or processing: M.F.Ç., M.Ç., M.İ., V.T.; Analysis and/or interpretation: M.F.Ç., M.Ç., M.İ., V.T.; Literature search: M.F.Ç., M.Ç.; Writing: M.İ., V.T.; Critical review: M.F.Ç., M.Ç., M.İ., V.T.

**Conflict of Interest:** None declared.

**Use of AI for Writing Assistance:** Not declared.

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## REFERENCES

1. Çelik E, Koç A. Analysis of free-fall bullet injury potential in the cranium via finite elements method. *J Forensic and Legal Med* 2023;102552.
2. Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality 2018-2021 on CDC WONDER Online Database, released in 2021. Data are from the Multiple Cause of Death Files, 2018-2021, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Available from: <http://wonder.cdc.gov/ucd-icd10-expanded.html>. Accessed Mar 4, 2024.
3. Rodriguez I, Mirabal-Colon B, Alonso-Echanove J, Rodriguez C, Rullan J, Crosby A, et al. New Year's Eve injuries caused by celebratory gunfire-Puerto Rico 2003. *MMWR: Morbidity and Mortality Weekly Report* 2004;53:1174-5.
4. Rapkiewicz AV, Shuman MJ, Hutchins KD. Fatal wounds sustained from "falling bullets": Maintaining a high index of suspicion in a forensic setting. *J Forensic Sciences* 2014;59:268-70. [CrossRef]
5. Parada SA, DeVine JG, Arrington ED. Celebratory gunfire injury to a United States soldier sustained during Operation Iraqi Freedom (OIF). *Injury Extra* 2009;40:149-51. [CrossRef]
6. Abdali H A, Hoz SS, Moscote-Salazar LR. Cranial gravitational (falling) bullet injuries: Point of view. *J Neurosciences in Rural Practice* 2018;9:278-80. [CrossRef]
7. Al-Tarshihi MI, Al-Basheer M. The falling bullets: post-Libyan revolution celebratory stray bullet injuries. *European J Trauma & Emer Surg* 2014;40:83-5. [CrossRef]
8. Incorvaia AN, Poulos DM, Jones RN, Tschirhart JM. Can a falling bullet be lethal at terminal velocity? Cardiac injury caused by a celebratory bullet. *The Annals Thoracic Surg* 2007;83:283-4. [CrossRef]
9. Kadhim AH, Neamah MJ, Nema IS. Cranial falling bullet injuries, a series of 30 cases in Iraq. *British J Neurosurgery* 2020;34:135-41. [CrossRef]
10. Das K, Karateke F, Onel S, Ozkaya M, Okten Aİ, Aziret M, Ozdogan M. Can tired bullets cause serious injuries? A case report and review of the literature. *Injury* 2013;44:144-5. [CrossRef]
11. Devassy S, Cholassery ZA. Celebratory firing: a journey from marriage procession to funeral march. *J Medical Academics* 2020;3:22-4. [CrossRef]
12. Lacy AJ, Lataska KM, High K, Russ S. A celebration with unforeseen consequences: Celebratory gunfire causing injury. *The American J Emer Med* 2022;58:350-e1. [CrossRef]
13. Alsabbagh Q, Kanaan T, Dumour EA, Hadidi F, Al-Sabbagh MQ. An incidental migrating intra-spinal bullet: the silent victim of celebratory gunfire. *British J Neurosurgery* 2023;37:1358-61. [CrossRef]
14. Petty JK, Henry MCW, Nance ML, Ford HR; APSA Board of Governors. Firearm injuries and children: position statement of the American Pediatric Surgical Association. *Pediatrics* 2019;144:e20183058. [CrossRef]
15. Ordog GJ, Dornhoffer P, Ackroyd G, Wasserberger J, Bishop M, Shoemaker W, et al. Spent bullets and their injuries: the result of firing weapons into the sky. *J Trauma* 1994;37:1003-6. [CrossRef]
16. Ali SA, Tahir SM, Makhdoom A, Shaikh AR, Siddique AJ. Aerial firing and stray bullet injuries: a rising tide. *Iran Red Crescent Med J* 2015;17:e26179. [CrossRef]
17. Yasuntimur A, Ögünç Gİ. Individual Armament and Violence: The Current Status of Firearm Violence. *J Security Scien* 2022;11:167-200.
18. Orhan G, Yeter ÖB. Individual Armament as an internal security threat: an assessment of Turkey's Position with policy alternatives. *ASSAM-UHAD* 2019:130-43.

## ORJİNAL ÇALIŞMA - ÖZ

### Tehlikeli bir gelenek: Üçüncü basamak üç hastanede kutlama amaçlı ateşli silah kullanımına bağlı yaralanmaların retrospektif analizi

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**AMAÇ:** Kutlamalarda silahların havaya ateşlenmesi, kamu güvenliği için önemli riskler oluşturan bir gelenektir. Yorgun mermi yaralanması olarak isimlendirilen bu olay sonrası düşen bu mermiler yüksek hızlara ulaşabilir ve bir kişiye, hayvana veya eşyaya çarpması durumunda ciddi yaralanma veya ölüme neden olma potansiyeline sahip olabilir.

**GEREÇ VE YÖNTEM:** Bu çalışmanın amacı, 2014-2023 yılları arasındaki 10 yıllık dönemde Türkiye'nin iki farklı kentindeki 3 farklı hastaneye başvuran kutlama amaçlı silah ateşine bağlı yaralanmaların (CGRI) retrospektif olarak tespit edilmesi ve sonuçlarının araştırılmasıdır.

**BULGULAR:** Trabzon Kanuni Eğitim ve Araştırma Hastanesi, Karadeniz Teknik Üniversitesi Tıp Fakültesi Farabi Hastanesi ve Yeditepe Üniversitesi Kozyatağı Hastanesi'nden elde edilen veriler, 48 yorgun mermi yaralanması vakasını ortaya koydu; bu yaralanmaların %64.6'sını erkekler oluşturdu. 0-17 yaş arası çocuklar en çok etkilenen grup, baş-boyun-yüz bölgesi en sık yaralanan bölge iken, vakaların çoğunluğunun kırsal alanlarda gerçekleştiği belirlendi. Sekiz vaka (%16.7) ölümlü sonuçlandı. Silahların ateşlenme nedenleri vakaların %43.8'inde belirlenemedi.

**SONUÇ:** Sosyolojik olarak, bazı toplumlarda silah sahipliği prestij anlamına gelir ve genellikle düğünlerde kutlamalara yönelik silah kullanımını tetikler. Ancak bu gelenek, dünya çapında trajedilere yol açabilmektedir. Ruhsatsız silah kullanımını önlemek için daha sıkı düzenlemeler ve yasal altyapılara ihtiyaç vardır. Kutlamalarda ateşlenen silahların toplum olarak normal görülmesine karşı etkili bir mücadele için işbirlikçi çabalar hayati öneme sahiptir. Gelecekte yapılabilecek prospektif çalışmalar, CGRI insidansını kapsamlı bir şekilde değerlendirebilir ve kamu sağlığını korumak için önleyici stratejilerin belirlenmesinde rol alabilir.

**Anahtar sözcükler:** Ateşli silah yaralanmaları; halk sağlığı; kamu güvenliği; yorgun mermi.

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