

# Terrorist attacks in Türkiye: An analysis of counter-terrorism medicine

## Türkiye'deki terörist saldırılar: Karşı-terörizm tıbbi analizi

### Abstract

**Aim:** The objective of this research was to perform a counter-terrorism medicine analysis of terrorist attacks in Türkiye.

**Methods:** This study is a retrospective cross-sectional research. The study population consisted of terrorist incidents that occurred in Türkiye, as provided by the START Global Terrorism Database for the period from 1970 to 2020. Various characteristics of terror attacks in Türkiye were analyzed and presented in tabular form.

**Results:** Over the past 51 years, there have been a total of 4,485 terrorist incidents, with 91.2% reaching their intended targets as orchestrated by terrorist organizations in Türkiye. Of these incidents, 2,767 had detrimental economic impacts. Additionally, 17,570 individuals experienced adverse medical effects. Among the 81 provinces in Turkey, Istanbul witnessed the highest number of terrorist incidents and suffered the most significant medical consequences.

**Conclusion:** Türkiye has been significantly impacted by terrorist incidents over the past fifty years especially within the last decade, particularly in metropolitan provinces like Istanbul. These events have negatively affected both the health and economic well-being of many individuals. In response, while the country has implemented various security measures and preparedness strategies to mitigate such incidents, there is also a critical need to improve the readiness of healthcare services to effectively handle the potential consequences of terrorist attacks. This includes advancing anti-terror medicine and tactical medicine capabilities, as well as strengthening mass casualty management systems. Such improvements will ensure a more effective and coordinated response to large-scale emergencies, ultimately saving lives and reducing the long-term impacts on society.

**Keywords:** Ambulances, disaster medicine, emergency medical services, Türkiye

### Öz

**Amaç:** Bu araştırmanın amacı, Türkiye'deki terörist saldırılar üzerine bir karşı terörizm tıbbi analizi gerçekleştirmektir.

**Yöntemler:** Bu çalışma, retrospektif kesitsel bir araştırmadır. Çalışma popülasyonu, 1970 ile 2020 yılları arasında Türkiye'de meydana gelen terörist olayları kapsamaktadır ve bu olaylar START Küresel Terörizm Veritabanı tarafından sağlanmıştır. Türkiye'deki terör saldırılarının çeşitli özellikleri analiz edilmiş ve tablo halinde sunulmuştur.

**Bulgular:** Geçtiğimiz 51 yıl içinde Türkiye'de toplam 4,485 terörist olay gerçekleşmiş, bu olayların %91,2'si terörist organizasyonlar tarafından planlandığı gibi hedeflerine ulaşmıştır. Bu olaylardan 2,767'si ekonomik olarak zarar verici etkilere sahiptir. Ayrıca, 17,570 kişi yaralanmış veya sağlık açısından olumsuz etkilenmiştir. Türkiye'deki 81 il içinde, en fazla terörist olayın yaşandığı ve en ciddi tıbbi sonuçların görüldüğü il İstanbul olmuştur.

**Sonuç:** Türkiye, özellikle İstanbul gibi büyükşehirler geçtiğimiz elli yılın özellikle son on yılında terörist olaylardan önemli ölçüde etkilenmiştir. Bu olaylar birçok bireyin sağlık ve ekonomik refahını olumsuz yönde etkilemiştir. Bunlara yanıt olarak, kamu otoritesi çeşitli güvenlik önlemleri ve hazırlık stratejileri uygulamıştır. Aynı zamanda terörist saldırıların olası sonuçlarını etkili bir şekilde ele alabilmek için sağlık hizmetleri hazırlığını artırma da kritik bir ihtiyaçtır. Bu hazırlıklar, karşı-terör tıbbi ve taktik tıp yeteneklerini iletmeyi, ayrıca kitlesel yaralanma yönetim sistemlerini güçlendirmeyi içermektedir. Bu iyileştirmeler, büyük çaplı acil durumlara daha etkili ve koordine bir yanıt verilmesine, daha fazla hayat kurtarılmasına ve toplum üzerindeki uzun vadeli etkilerin azaltılmasına katkıda bulunacaktır.

**Anahtar Sözcükler:** Acil tıbbi hizmetler, afet tıbbi, cankurtaranlar, Türkiye

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## INTRODUCTION

Terrorist attacks pose unique challenges in various sectors, including the state, society, aid organizations, the healthcare sector, and infrastructure services (1). Terrorism is generally designed to increase fear, panic, and stress in society by targeting vulnerable individuals and infrastructure. While terrorism has a long history, there has been a significant increase in it since 2001 (2). This increase is linked to the terrorist attacks on September 11, 2001, and it is referred to as the beginning of the “new era” of terrorism (3–5). However, an increase in terrorist incidents has also been observed with the onset of the uprising in Syria in 2011 and the emergence of the Islamic State of Iraq and Syria (ISIS) in 2013. Türkiye has been directly and indirectly affected by these events (6).

Türkiye has historically been adversely affected by terrorism due to its geopolitical location (7). As a result, terrorist incidents in Türkiye date back to the 1960s (8). Today, Türkiye continues to be one of the countries frequently targeted in terrorist attacks. According to studies, Türkiye ranks twenty-third among the countries most affected by terrorist attacks worldwide and holds the first position among European and Turkic States (9). One of the reasons for this ranking is the existence of a power vacuum in some countries located in Türkiye’s southern region. This power vacuum has led to a significant increase in irregular migrants and refugees attempting to reach Europe through Türkiye, originating from the Middle East. This situation has contributed to the rise in the number of irregular migrants and refugees in Türkiye. Additionally, Türkiye has been adversely affected by events such as the Iran-Iraq and Gulf wars in the Middle East, the Syrian civil war, crises in Bosnia and Kosovo in the Balkans, territorial disputes in the Aegean Sea with Greece, and conflicts in the Caucasus region, including Nagorno-Karabakh, Chechnya/Russia, South Ossetia/Georgia, and Abkhazia/Georgia. These events increase Türkiye’s risk of involvement in conflicts and the likelihood of an increase in terrorist incidents (10). Türkiye is adversely affected by various terrorist groups, including those originating from neighboring countries as well as domestic organizations such as the Fethullah Terrorist Organization (FETÖ), the Kurdistan Workers’ Party (PKK), the Rev-

olutionary People’s Liberation Party/Front (DHKP-C), Al-Qaeda, the Armenian Secret Army for the Liberation of Armenia (ASALA), and the Islamic State of Iraq and Syria (ISIS) (11). Therefore, Türkiye contributes to capacity-building efforts by international and regional organizations, such as the United Nations, to combat terrorism (12). However, to prevent terrorist incidents within its own borders and better prepare the first responders for future terrorist attacks, Türkiye needs to understand the historical context and methodologies of past attacks (13). Therefore, it is important to methodologically examine the frequency of terrorist incidents, types of weapons used, nature of attacks, target groups, and the resulting health issues that have occurred in Türkiye from the past to the present. This study, in this context, aims to conduct an epidemiological analysis of terrorist attacks that occurred in Türkiye between 1970 and 2020, focusing on incident locations, weapons used, types of attacks, property damage, information about target victims, and their medical consequences.

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## METHODS

This study is a cross-sectional epidemiological research. The study population consists of terrorist attacks that occurred in Türkiye between 1970 and 2020, as documented in the Global Terrorism Database (GTD) data file provided by START (The National Consortium for the Study of Terrorism and Responses to Terrorism). The aim of this study is to conduct an epidemiological analysis of terrorist attacks in Türkiye, focusing on incident locations, weapons used, types of attacks, information about target victims, and their medical consequences.

### Data Source

The data source for this study involved downloading the GTD raw data file from the START (The National Consortium for the Study of Terrorism and Responses to Terrorism) website. The GTD is a freely accessible database containing information on terrorist incidents that occurred worldwide between 1970 and 2020 (excluding 1993). This database systematically records information on both national and international terrorist events and currently encompasses over 200,000

incidents. For each event, data is available on variables such as the year, location, number of injuries and fatalities, target, and responsible group (14). Publications generated from GTD data can be regularly accessed from the START website. This study constitutes a secondary analysis of the GTD data.

### Definitions

The National Consortium for the Study of Terrorism and Responses to Terrorism, also known as START, is a research and education center that conducts scientific research on the causes and medical consequences of national and international terrorism. The START website hosts various databases, including START Datasets, IVEO Knowledge Matrix, GTD (Global Terrorism Database), Big Allied and Dangerous, TEVUS Portal, PIRUS dataset, and Nuclear Facilities Attack Database, among others (15).

The GTD available on the START website is a database that contains systematic data on national and international terrorist incidents. According to this database, a terrorist attack is defined as the unlawful use of force or violence, threatened or actual, by a non-state actor or group (actor) to attain a political, economic, religious, or social goal through fear, coercion, or intimidation (16). For an event to be included in the GTD, it must be intentional and involve a certain level of violence or an imminent threat of violence.

### Inclusion Criteria

An event is included in the raw data file of the GTD if it meets the three pre-defined inclusion criteria set by the GTD for it to be considered a terrorist attack:

- Criterion 1: The act must be aimed at attaining a political, economic, religious, or social goal.
- Criterion 2: There must be evidence of an intention to coerce, intimidate, or convey some other message to a larger audience (or audiences) than the immediate victims.
- Criterion 3: The action must be outside the context of legitimate warfare activities.

When an event fails to meet any of the three inclusion criteria set by the GTD or when there is uncertainty, the events are excluded. It is important to note that these criteria are determined within the database itself, not by the researchers.

In order to achieve the objectives of the study, the researchers developed inclusion criteria among the 135 variables available in the GTD (Table 1). Those events that met the criteria were included in the study.

### Data Preparation

The GTD metadata file was downloaded from the START website in August 2022. The downloaded GTD metadata file was then uploaded into IBM SPSS Statistics Version 22, and a search was conducted for terrorist attacks that occurred in Türkiye. As a result of the search, the data that met the inclusion criteria of the study were saved in a Microsoft Excel file. Since the data for the years 2021-2023 were not yet available at the time of downloading the GTD metadata file, the data for those years were not recorded.

### Data Analysis and Ethics

Frequency analysis is conducted to determine the number of incidents, deaths, injuries, and property damages caused by terrorist attacks in Türkiye, categorized by year and province. Additionally, frequency distributions are analyzed to determine the number of incidents, deaths, and injuries based on information related to the weapon used, type of attack, target group, and perpetrator for each terrorist event. The study's data were designed for retrospective analysis based on publicly accessible information, aiming to analyze the locations, weapons, types of attacks, target victims, perpetrators, and medical outcomes of those terrorist attacks that occurred in Türkiye. Therefore, ethical review board approval was not required for the study's data. The identities of the attackers from the GTD metadata file were excluded from the study data. No assessment of the accuracy of the GTD data was performed.

## RESULTS

### General Results

Between 1970 and 2020, there were a total of 4,485 terrorist incidents that met the inclusion criteria of both the GTD and the study. Of these terrorist attacks, 91.2% achieved their intended objectives as planned by different terrorist organizations. These attacks had adverse economic consequences in 61.7% of the cases

**Table 1.** GTD variables and subcategories in the study

GTD variables and subcategories in the study	
Variables	Subcategories
Date	Year (1970-2020)
Inclusion criteria	Crit1, crit2, crit3
Country	Türkiye
City	All
Attack type	Assassination, hijacking, kidnapping, barricade incident, bombing/explosion, armed assault, unarmed assault, facility/infrastructure attack, unknown
<i>Succes of attack</i>	Yes/no
<i>Suicide attack</i>	Yes/no
Weapon type	Biological, chemical, radiological, nuclear, firearms, explosives, fake weapons, incendiary, melee, vehicle, sabotage equipment, other, unknown
Target/victim information	Business, government (general), police, military, abortion related, airports & aircraft, government (diplomatic), educational institution, food or water supply, journalists & media, maritime (includes ports and maritime facilities), NGO, other, private citizens & property, religious figures/institutions, telecommunication, terrorists/non-state militias, tourists, transportation (other than aviation), unknown, utilities, violent political parties, Total number of fatalities
Casualties and consequences	Total number of injured Property damage (yes/no/unknown) Extent of property damage
International - logistical	Yes/no/unknown
International- ideological	Yes/no/unknown
International- miscellaneous	Yes/no/unknown

\*GTD = Global terrorist attacks

**Table 2.** Number of incidents, deaths, injuries and property damage by province

Province	Incident	Injured	Death toll	Property damage
Adana	102	154	74	68
Adıyaman	19	19	59	14
Ağrı	59	134	236	37
Amasya	2	6	1	2
Ankara	301	756	383	215
Antalya	33	158	23	21
Artvin	4	2	10	4
Aydın	7	16	6	5
Balıkesir	6	1	8	4
Bingöl	91	204	175	56
Bitlis	64	88	118	30
Burdur	2	2	1	-
Bursa	14	30	13	8
Çankırı	1	10	4	1
Çorum	2	0	2	-
Denizli	2	8	5	2
Diyarbakır	380	1.256	537	141
Edirne	1	0	0	1
Elazığ	32	255	80	25
Erzincan	17	27	23	12

Province	Incident	Injured	Death toll	Property damage
Erzurum	25	13	48	14
Eskişehir	2	0	4	2
Gaziantep	47	247	115	21
Giresun	5	7	2	2
Gümüşhane	6	4	14	3
Hakkâri	335	668	816	125
Hatay	60	272	122	29
Isparta	1	0	0	-
Mersin	32	53	31	23
İstanbul	1.075	2.654	776	824
İzmir	132	177	63	108
Kars	30	11	33	17
Kastamonu	3	0	22	1
Kayseri	12	81	38	5
Kırklareli	1	0	0	1
Kırşehir	1	2	0	1
Kocaeli	8	46	10	5
Konya	9	3	16	6
Kütahya	1	0	5	1
Malatya	17	9	24	14
Manisa	10	1	5	6
Kahramanmaraş	21	43	77	19
Mardin	255	613	485	140
Muğla	12	16	3	8
Muş	36	48	26	24
Nevşehir	1	0	2	-
Niğde	1	6	3	-
Ordu	8	6	9	4
Sakarya	4	97	18	3
Samsun	13	18	23	11
Siirt	97	109	203	56
Sinop	1	7	2	1
Sivas	14	10	23	13
Tokat	14	12	16	6
Trabzon	18	37	31	9
Tunceli	114	174	191	54
Şanlıurfa	78	237	143	39
Uşak	1	1	0	-
Van	129	383	139	74
Zonguldak	4	0	5	4
Kırıkkale	6	45	8	4
Batman	59	92	107	34
Şırnak	367	602	797	196
Bartın	1	2	1	1
Ardahan	5	2	9	4
Iğdır	24	33	43	14
Kilis	70	129	41	51
Osmaniye	14	4	14	7
Bilinmeyen	167	347	802	137
Toplam	4.485	10.447	7.123	2.767

**Table 3.** Incidents, number of injured, and number of fatalities by attack type

Attack type	Incidents		Injured		Death toll	
	n	%	n	%	n	%
Assassination	440	9,8	279	2,6	552	7,7
Armed assault	1.325	29,6	1.992	19,0	3.863	54,2
Bombing	2.069	46,1	7.825	74,9	2.221	31,2
Hijacking	13	0,3	9	0,8	9	0,1
Hostage taking (Barricade incident)	14	0,3	1	0,0	6	0,1
Hostage taking (kidnapping)	166	3,7	17	0,1	69	1,0
Facility attack	292	6,5	64	0,6	60	0,9
Unarmed assault	13	0,3	28	0,2	21	0,3
Unknown	153	3,4	232	2,2	322	4,5
Total	4.485	100	10.447	100	7.123	100

n: Number, %: Percentage

**Table 4.** Number of incidents, deaths and injuries by type of weapon

Weapon type	Events		Death toll		Injured	
	n	%	n	%	n	%
Biological	-	-	-	-	-	-
Chemical	2	0,0	21	0,3	-	-
Radiological	-	-	-	-	-	-
Nuclear	-	-	-	-	-	-
Firearms	1.624	36,2	4.232	59,4	1.924	18,4
Explosives	2.177	48,6	2.370	33,3	8.107	77,6
Fake weapons	1	0,0	-	-	-	-
Incendiary	310	6,9	74	1,0	61	0,6
Melee	48	1,1	27	0,4	46	0,4
Vehicle	-	-	-	-	-	-
Sabotage equipment	1	0,0	-	-	-	-
Other	1	0,0	-	-	-	-
Unknown	321	7,2	399	5,6	309	3,0
Total	4.485	100	7.123	100	10.447	100

n: Number, %: Percentage

and negatively affected the health of 17,570 individuals. Among these incidents, 106 were carried out by foreign nationals as perpetrators, 320 involved perpetrators of different nationalities (non-Turkish citizens) than the target country, and 313 instances had foreign nationals as the victims of the attacks. Furthermore, 81 of these incidents included suicide attacks.

### **Medical Outcomes, and Property Damage by Year Distribution and Provinces**

Supplement 1 provides incident, fatality, injury counts, and property damage in Türkiye based on the year distribution. In Türkiye, the highest number of incidents occurred in the past 11 years (n=1,732; 38.6%), while the lowest number of incidents was observed between

**Table 5.** Incidents, fatalities, and injuries by attacker's target type

Target type	Incident (%)	Death toll (%)	Injured (%)
Business	652 (14,5)	414 (5,8)	1.284 (12,3)
Government (general)	470 (10,5)	395 (5,6)	617 (5,9)
Police	714 (15,9)	1.279 (18,0)	2.069 (19,8)
Military	1.033 (23,0)	2.896 (40,7)	2.381 (22,8)
Abortion related	-	-	-
Airports & aircraft	38 (0,8)	76 (1,1)	379 (3,6)
Government (diplomatic)	88 (2,0)	29 (0,4)	262 (2,5)
Educational institution	162 (3,6)	89 (1,2)	171 (1,6)
Food or water supply	5 (0,1)	2 (0,0)	0 (0)
Journalists & media	78 (1,7)	44 (0,6)	63 (0,6)
Maritime (includes ports and maritime facilities)	4 (0,1)	4 (0,0)	6 (0,1)
Non-governmental organization (NGO)	9 (0,2)	3 (0,0)	5 (0,0)
Other	4 (0,1)	0 (0)	0 (0)
Private citizens & property	728 (16,2)	1.338 (18,8)	2.196 (21,0)
Religious figures/institutions	42 (1,0)	68 (1,0)	351 (3,6)
Telecommunication	11 (0,3)	9 (0,1)	1 (0,0)
Terrorists/non-state militias	48 (1,1)	74 (1,0)	63 (0,6)
Tourists	17 (0,4)	61 (0,9)	80 (0,8)
Transportation (other than aviation)	152 (3,4)	263 (3,7)	404 (3,9)
Unknown	110 (2,4)	39 (0,5)	40 (0,4)
Utilities	71 (1,6)	21 (0,3)	52 (0,5)
Violent political parties	49 (1,1)	19 (0,3)	23 (0,2)
Total	4.485 (100)	7.123 (100)	10.447 (100)

n: Number, %: Percent

1980 and 1989 (n=340; 7.6%). Over the last 51 years, the highest number of fatalities occurred between 1990 and 1999 (n=3,656; 50.0%), while the highest number of injuries was recorded between 2010 and 2020 (n=5,612; 53.7%). Out of the 4,485 terrorist attacks that occurred between 1970 and 2020, 61.7% resulted in property damage.

Table 2 presents the incidents, fatalities, injuries, and property damages of terrorist attacks in Türkiye by provinces. Between 1970 and 2020, terrorist attacks occurred in 68 provinces of Türkiye, while 13 provinces did not experience any terrorist attacks. Istanbul had the highest number of terrorist incidents, the most significant property damages, and the highest medical impact among the 68 provinces. Among these provinces, Istanbul also had the highest number of injuries, while Hakkari province had the highest number of fatalities.

### Medical Outcomes by Attack Types, Weapon Types and Property Damage

Table 3 provides the number of incidents, fatalities, and injuries by attack type for terrorist attacks that occurred in Türkiye. Among the attack types, bombing (with 2,069 incidents, 46.1% of total incidents) was the most frequent attack type and resulted in the highest number of injuries (7,825 incidents, 74.9%). The least common attack type was hijacking (13 incidents, 0.3%). Among these attack types, armed assaults (3,863 fatalities, 54.2%) had the highest number of fatalities, while hostage-taking (barricade incidents) had the lowest number of fatalities and injuries (6 incidents, 0.1%).

Among the 13 types of weapons selected for carrying out terrorist attacks in Türkiye, four weapon types were not used, including biological, radiological,

nuclear, and vehicle weapons. Among the nine weapon types used by terrorist organizations, explosive weapons were the most frequently chosen, with 2,177 incidents. The least preferred weapon types were fake weapons, sabotage weapons, and other weapons. There were no injuries or fatalities reported in seven weapon types: biological, radiological, nuclear, fake weapons, vehicles, sabotage equipment, and others. Among the weapon types, the highest number of fatalities occurred in firearms (4,232 incidents, 59.4%), while the highest number of injuries was associated with explosive weapons (8,107 incidents, 77.6%) (Table 4).

### Medical Outcomes by Attacker's Target Type

Table 5 provides the number of incidents, fatalities, and injuries in terrorist attacks in Türkiye based on the attacker's choice of target type among 22 target categories. The attackers did not prefer to carry out attacks related to 'Abortion-related' targets. The most preferred target type by the attackers (1,033 incidents, 23.0%) and the target type with the highest number of fatalities (2,896 incidents, 40.7%) and injuries (2,280 incidents, 22.8%) were 'Military (Army)' targets. Following attacks on the military, the target types with the highest number of incidents, fatalities, and injuries were 'Private Citizens & Property' (Incidents=728; 16.2%; Fatalities=1,338; 18.8%; Injuries=2,196; 21.0%), 'Police' (Incidents=714; 15.9%; Fatalities=1,279; 18.0%; Injuries=2,069; 19.8%), and 'Business' (Incidents=652; 14.5%; Fatalities=414; 5.8%; Injuries=1,284; 12.3%)

## DISCUSSION

This study is significant as it represents the first epidemiological analysis of 4,485 terrorist attacks that occurred in Türkiye between 1970 and 2020, encompassing weapon types, attack types, target types, and medical outcomes. Furthermore, the study discusses the medical outcomes and material damage by year and province, medical outcomes by weapon and attack type, and medical outcomes by attacker's target type. These three subcategories are analyzed collectively to provide a holistic understanding of the impact of terrorism during the specified period.

Terrorism encompasses events designed by terrorist organizations or individuals/groups inspired or supported by certain countries (state-sponsored) with the aim of causing violence, disruption, and autonomy through criminal means (17). It is stated that these events have developed due to various factors such as demographic changes in the country, migration and the rise of xenophobic policies (18). In other words, acts of terrorism are shaped by factors such as a country's geographical location, economic status, sociodemographic changes, incoming migrations, and xenophobia. Due to its geopolitical location, conflicts or wars in neighboring countries, internal clashes among different ethnic groups, and sociodemographic changes (8), Türkiye has become the country with the highest number of terrorist attacks among European countries and Turkic states (9).

Türkiye is composed of seven regions: the Mediterranean, Eastern Anatolia, Aegean Sea (Islands), Southeastern Anatolia, Central Anatolia, Black Sea, and Marmara. It consists of eighty-one provinces. In Türkiye, between 1970 and 2020, there were at least one and up to 1,075 terrorist attacks in 68 provinces (Supplement 1). Among these terrorist attacks, explosives and firearms were the most commonly used weapons, while fake weapons, sabotage equipment, and other weapons were used the least (Table 4). In the literature, firearms and explosives are widely observed as the types of weapons that terrorist organizations commonly use against the general population (19–25). In a study examining terrorist incidents in an African country, it was found that firearms (45%) and explosives (31%) were frequently used (1). The reasons behind the widespread use of these weapon types include their ease of transport, facilitating the escape of terrorists, and their effectiveness in causing harm to human life from a considerable distance (26). Additionally, the production and ease of crossing international borders and their ready availability have led to an increase in their use in recent years (26). This increase results in greater medical consequences for individuals at the scene and a higher number of casualties.

Firearms and explosive weapon types lead to numerous medical problems. For example, they can cause mass injuries, disabilities, and fatalities in an instant. While firearms resulted in the highest number of



deaths in terrorist attacks in Türkiye, explosive weapons caused the most injuries (Table 3). Similar results were obtained in a cross-sectional study conducted on terrorism in Türkiye (27,28). A similar outcome was also observed in a study focused on an African country (29). In another study, it was noted that firearms used in terrorist incidents caused the highest number of mass casualties, with explosives being the second most lethal weapon type (30). There are various types of injuries associated with explosion wounds. These injuries vary depending on the variability from the primary to the quaternary effect areas generated by the explosion mechanism (31). However, the severity and type of injuries resulting from explosions differ based on the causes of the explosion, the power of the explosion, the open or closed configuration, damage to structures, and various factors (32). Nevertheless, it was concluded that head and lung injuries caused by explosions were among the leading causes of death in terrorist attacks (32).

Medical intervention is a crucial component of responding to terrorist attacks. However, various factors limit the ability of healthcare professionals to respond to such incidents. These factors include mass casualties and fatalities, the hostage-taking by the perpetrator, the lack of safety at the scene, and healthcare professional's inadequate experience and knowledge (33). These factors can vary depending on the type of attack. Terrorism incidents encompass different types of attacks, including armed assaults, vehicle attacks, bombings, hijackings, assassinations, unarmed attacks, abductions, and similar events. Although there may be differences in the mechanisms of these attack types, the severity of injuries resulting from terrorist attacks and the hospital mortality rate are very similar (34). In Türkiye, the most preferred types of attacks by terrorists in terrorist incidents are bombings, armed assaults, and assassinations. When considering the medical aspect of attack types in Türkiye, the highest number of fatalities is observed in armed assaults, while the highest number of injuries occurs in bombing attacks (Table 3). A study conducted on terrorist attacks in Scandinavian and Baltic countries also found that the armed assault type resulted in the highest number of fatalities and injuries compared to other attack types (25). In a global study on terrorist attacks worldwide,

it was observed that among the attack types, the most deadly injuries occurred in bombing and armed assault incidents (35). As a result, bombings and armed assaults can be considered the most commonly used and medically impactful types of attacks in terrorist incidents. However, in terrorist attacks that occurred in Türkiye, it is observed that the most preferred and medically affected target type by terrorists is attacks on the military. A study on terrorist attacks in Africa also found that terrorists commonly prefer the target type of private citizens and property (29). Similarly, a study on terrorist attacks in Eastern Europe yielded a similar result (19). In Türkiye, after the military, this target type is the second most preferred by terrorists (Table 5).

Terrorist incidents not only affect individuals, communities, and the state from a medical perspective but also have negative social and economic implications. Terrorism can impact a country's economy in various ways, diminishing its economic prosperity, development, and both human and physical capital, potentially leading to increased military spending (36). These economic effects can slow down a country's progress. For example, following the September 11 attacks, it was reported that economic investments in the United States significantly decreased compared to previous years (37). In the case of Türkiye, it was concluded that 61% of terrorist incidents had a detrimental impact on the country's economy (Supplement 1). Therefore, it can be stated that Türkiye has been adversely affected by terrorism both economically and medically when compared to other European countries and the Turkic States. Consequently, Türkiye has been engaged in combating terrorism on multiple fronts for many years (7).

Türkiye is involved not only in the field but also in various regional and global counter-terrorism projects. For instance, Türkiye has participated in one of the largest national and international development projects, the Southeastern Anatolia Project (8). Furthermore, Türkiye is engaged in capacity-building programs with requesting countries, facilitating security cooperation agreements, and conducting negotiations for new agreements (12). However, Türkiye must effectively prepare its healthcare services for potential terrorist incidents (7). To achieve this, training pro-

grams for pre-hospital healthcare professionals should be established within the scope of counter-terrorism, and the content of these training programs should be regularly updated according to various terrorist factors. For instance, emergency planning should be tailored to the types of attacks and weapons that have the most significant medical impact in Türkiye. Furthermore, an educational program should cover triage and the various injury types and complications resulting from these attacks, along with the development of corresponding strategies (38). However, both healthcare professionals and institutions responsible for responding to terrorist incidents should be trained in areas such as terrorism awareness and supported through drills to enhance their preparedness (39). These trainings can reduce complications among casualties of mass-casualty terrorist incidents and lower the hospital mortality rate (32).

## LIMITATIONS

This study has several limitations. First, as mentioned in the methodology, the data for this study was obtained from the GTD database. GTD aims to comprehensively record global terrorism events. This database relies on media reports to gather data related to terrorist incidents. Therefore, there is a possibility of bias and data gaps in the existing data, and the study constitutes a secondary analysis of the GTD data. Additionally, since the database focuses on terrorist attacks carried out by non-state actors, it may not include all terrorist incidents that occurred in Türkiye between 1970 and 2020. Finally, the GTD database covers terrorist attacks that took place between 1970 and 2020, which means that terrorist incidents in Türkiye from the last three years were not included in the study.

## CONCLUSION(s)

Türkiye has grappled with terrorism for many years due to its geopolitical location, conflicts in neighboring countries, and various other factors. In the past 51 years, Türkiye witnessed 4,485 terrorist incidents, impacting 17,570 individuals negatively from a medical perspective. Istanbul, the largest province in Türkiye,

saw the highest number of terrorist incidents and was the most affected in terms of medical consequences. Explosive weapons were the most commonly used type of weapon in terrorist attacks (48.6%), causing significant medical consequences for a large number of people compared to other weapon types. When comparing terrorist incidents based on target types, it was observed that the military was the primary target of terrorists in Türkiye, likely due to conflicts near the country's borders. In a year-to-year comparison, there was an increase in terrorist incidents in the last decade. This increase could be attributed to factors such as power vacuums in neighboring countries and the influx of refugees. In light of these challenges, Türkiye should develop enhanced security strategies to combat terrorism and take measures and preparedness initiatives to strengthen its healthcare services. In this context, integrating theoretical and practical courses on Disaster and War Medicine and Chemical, Biological, Radiological, and Nuclear (CBRN) issues into the medical education curriculum is crucial. Additionally, the expansion of disaster-emergency hospital capacities and the frequent conducting of disaster-emergency drills at the provincial and hospital levels—with active participation from emergency coordinators of central health authorities and subsequent reporting of deficiencies—should be prioritized.

## Conflict-of-interest and financial disclosure

The authors declare that they have no conflict of interest to disclose. The authors also declare that they did not receive any financial support for the study.

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