Medicide in the Gaza Strip: A one-year anatomy of systematic attacks on healthcare services

Gazze Şeridi'nde medicide: Sağlık hizmetlerine yönelik sistematik saldırıların bir yıllık anatomisi

Abstract

Aim: This study critically examines the systematic targeting of healthcare services in the Gaza Strip, positioning these attacks as a deliberate form of medicide. This concept, defined as the intentional destruction of healthcare systems in conflict zones, highlights violations of international humanitarian law and underscores the broader implications for global health security and human rights.

Methods: Employing an observational-descriptive retrospective design, the study utilized data from the World Health Organization (WHO) and other international reports. Advanced correlation and regression analyses were conducted to identify the relationships between attack frequency, infrastructure damage, mortality, and disruptions in emergency medical services. Temporal trends and attack patterns were further analyzed to assess the cumulative impact on healthcare systems.

Results: The findings reveal that over a one-year period, healthcare facilities, ambulances, and personnel in the Gaza Strip were subjected to systematic assaults, resulting in extensive infrastructure damage and significant loss of life. A sharp escalation in attacks was observed in the first six months, coinciding with increased mortality rates and service disruption. Strong statistical correlations confirm the profound impact of these attacks on the functionality and sustainability of healthcare systems, exacerbating the region's humanitarian crisis.

Conclusion: This study identifies medicide as a systematic strategy to dismantle essential healthcare infrastructure, with devastating consequences for vulnerable populations. It calls for urgent international action to reinforce legal frameworks, enhance protective mechanisms, and prioritize the resilience of healthcare systems in conflict settings. By advancing the discourse on the intersection of healthcare, conflict, and international law, this study provides a critical foundation for future policy and advocacy efforts.

Keywords: Ambulances; emergency medical services; Gaza Strip; health resources; health services accessibility; medical staffs

Öz

Amaç: Bu çalışma, Gazze Şeridi'nde sağlık hizmetlerine yönelik sistematik saldırıları medicide kavramı çerçevesinde ele almaktadır. Medicide, çatışma bölgelerinde sağlık sistemlerinin kasıtlı olarak yok edilmesini ifade eder. Çalışma, bu saldırıların uluslararası insancıl hukuk ihlalleriyle ilişkisini ve küresel sağlık güvenliği ile insan hakları üzerindeki geniş kapsamlı etkilerini vurgulamaktadır.

Yöntemler: Retrospektif nitelikte gözlemsel-tanımlayıcı bir tasarımın kullanıldığı çalışma, Dünya Sağlık Örgütü (WHO) ve diğer uluslararası raporlardan elde edilen verilere dayandırılmıştır. Saldırı sıklığı, altyapı hasarı, ölüm oranları ve acil sağlık hizmetlerindeki aksaklıklar arasındaki ilişkileri belirlemek için ileri düzey korelasyon ve regresyon analizleri yapılmıştır. Ayrıca, saldırıların zamansal eğilimleri ve desenleri değerlendirilerek sağlık sistemlerine yönelik birikimli etkiler incelenmiştir.

Bulgular: Bulgular, bir yıllık dönemde sağlık tesislerinin, ambulansların ve personelin sistematik saldırılara maruz kaldığını, bunun sonucunda ciddi altyapı hasarının ve kayıpların meydana geldiğini göstermektedir. İlk altı ayda saldırılarda keskin bir artış görülmüş ve bu durum ölüm oranları ile hizmet kesintilerinin artmasıyla ilişkilendirilmiştir. Güçlü istatistiksel korelasyonlar, bu saldırıların sağlık sistemlerinin işlevselliği ve sürdürülebilirliği üzerindeki derin etkisini doğrulamaktadır.

Sonuç: Bu çalışma, medicide kavramını, temel sağlık altyapısını kasıtlı olarak hedef alan bir strateji olarak tanımlamakta ve bunun savunmasız nüfuslar üzerindeki yıkıcı sonuçlarına dikkat çekmektedir. Çalışma, hukuki çerçevelerin güçlendirilmesi, koruyucu mekanizmaların iyileştirilmesi ve çatışma bölgelerinde sağlık sistemlerinin dayanıklılığının artırılmasını sağlamak için acil uluslararası eylem çağrısında bulunmaktadır. Sağlık, çatışma ve uluslararası hukuk arasındaki kesişim noktalarını ele alan bu çalışma, gelecekteki politika ve savunuculuk çabaları için kritik bir temel sunmaktadır.

Anahtar Sözcükler: Acil sağlık servisleri; cankurtaranlar; Gazze Şeridi; sağlık çalışanları; sağlık hizmetlerine ulaşılabilirlik; sağlık kaynakları

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INTRODUCTION

Armed conflicts profoundly impact societies and their development, leading not only to physical destruction but also to widespread social and humanitarian consequences (1). Access to fundamental human rights, such as security, food, and shelter, becomes a significant challenge in conflict zones (2,3). In this context, healthcare services are critical not only for individuals directly affected by violence but also for sustaining public health systems. Severe bottlenecks arise in areas vital to public health, such as access to clean water, vaccination programs, waste management, adequate nutrition, medical supplies, and hospital services (4-7). The breakdown of health systems in regions affected by hostilities further deteriorates the already fragile conditions of vulnerable populations, exposing them to increased risks of morbidity and mortality (1,8,9). Public health systems collapse under the dual pressures of destroyed infrastructure and heightened demand for medical services, deepening humanitarian crises even further (10).

Emergency health services in conflict zones play a crucial role, not only by delivering critical interventions to stabilize and treat the wounded but also by addressing broader challenges impacting public health. However, the delivery of these services is severely hindered by the conditions of war, particularly systematic attacks targeting medical facilities and healthcare workers (11). Such attacks constitute clear violations of international humanitarian law and contradict the principles of neutrality and protection that underpin medical ethics during wartime. As a result, essential health systems, including emergency medical services, become dysfunctional, leading to widespread humanitarian crises (9-11). According to data from the World Health Organization (WHO), damage to healthcare facilities, as well as the dramatic increase in deaths and injuries, highlights the devastating impact of these attacks (12). The findings unequivocally demonstrate that protecting emergency medical services remains a necessity, even amidst conflict, and that international humanitarian law plays a critical role in safeguarding these essential services (11,13).

The Gaza Strip, with over a year of ongoing conflict and instability, serves as a striking example of how health systems are deliberately targeted during war (14). Particularly in 2023, attacks on healthcare facilities, healthcare workers, and ambulances reached unprecedented levels, resulting in significant damage to infrastructure and considerable loss of life (12-14). These systematic attacks not only disrupt the provision of emergency medical services but also deprive already heavily affected communities of essential healthcare, further deepening humanitarian crises (9,10,15). Such deliberate actions are characterized by the concept of medicide, which refers to the intentional eradication of health systems to inflict widespread harm on a population (16,17).

This study aims to examine the systematic targeting of healthcare services in the Gaza Strip within the framework of international humanitarian law, highlighting the significant impacts of these violations on the sustainability of emergency medical services. Given the pre-existing fragility of Gaza's healthcare infrastructure, these attacks exacerbate existing challenges and place vulnerable populations at even greater risk. By investigating the mechanisms and consequences of these deliberate attacks, this research aims to emphasize the urgent need to protect healthcare services in conflict-affected regions. Furthermore, this study contributes to the existing literature by focusing specifically on the intentional nature of these violations in Gaza, a context that has been insufficiently explored in broader discussions on healthcare protection in conflict zones. These targeted assaults not only endanger public health but also disrupt the social fabric of affected communities, leading to long-term psychological and societal repercussions. This research employs a comprehensive approach, drawing on documented evidence of attacks and current conditions, to assess the broader implications for the enforcement of international humanitarian law and safeguarding of healthcare services in conflict environments.

MATERIAL AND METHODS

Data collection and analysis

This study was designed as an observational-descriptive and retrospective analysis to examine systematic attacks on healthcare services in the Gaza Strip

between October 7, 2023, and October 7, 2024. The study utilized publicly available reports and resources provided by the World Health Organization (WHO) and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA). Specifically, detailed information was extracted from WHO's Gaza Health Emergency Response Project datasets and OCHA's comprehensive reports on the impacts of conflicts in the Occupied Palestinian Territories (OPT). Only verifiable data pertaining to the Gaza Strip (North Gaza, Gaza City, Deir al Balah, Khan Yunis, and Rafah cities) were included, with a specific focus on all air and ground attacks targeting healthcare services within the one-year study period. The primary outcomes of the study were the number and type of attacks on healthcare services, the extent of damage to healthcare infrastructure, and the casualties reported among healthcare workers and patients. Secondary outcomes included temporal trends in the frequency and intensity of attacks and a comparative analysis of attack characteristics between two six-month periods. The data were categorized and analyzed based on variables such as the timing and type of attacks, affected groups, and damage to healthcare infrastructure. Special emphasis was placed on understanding the temporal progression of attacks and their cumulative effects on healthcare facilities and personnel.

Ethical considerations

This study does not require ethics approval as it is based on an open-access retrospective dataset. However, scientific ethical principles were strictly adhered to, with careful attention given to the principles of anonymity in data analysis. All data were processed in their original form without modifications, ensuring transparency and accuracy in reporting. The study was conducted in compliance with international ethical standards and the data usage principles outlined by the World Health Organization (WHO). Ethical considerations were continuously reviewed to ensure adherence to international guidelines, particularly in the use of conflict-related data.

Statistical analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA) version 23.0. The normality of data was assessed using the Shapiro-Wilk and Kolmogorov-Smirnov tests. The normality of data was assessed using the Shapiro-Wilk and Kolmogorov-Smirnov tests. Pearson correlation was performed to examine the strength of relationships between variables. Additionally, time-series analysis was incorporated to identify trends over the study period. Linear and Binary Logistic Regression were employed as part of the regression analyses. The linear regression analysis focused on the predictive relationships between the number of attacks, the extent of damage to healthcare facilities, and the number of resulting casualties, while logistic regression compared differences in attack characteristics between two defined 6-month periods. Statistical significance was set at a p-value of <0.05 within a 95% confidence interval for all tests. A post-hoc power analysis was performed to confirm the adequacy of the sample size for detecting significant trends.

RESULTS

Between October 7, 2023, and October 7, 2024, systematic attacks on healthcare services in the Gaza Strip had significant adverse impacts on health infrastructure, services, and healthcare workers. During the study period, the total number of recorded attacks on healthcare services exhibited a consistent upward trend, culminating in 516 attacks by the end of the analysis. These attacks resulted in 765 reported deaths, including medical staff, and 990 injuries. Furthermore, the total number of damaged healthcare facilities, encompassing hospitals and primary healthcare centers, was documented at 110. Among these facilities, 32 were damaged hospitals, while the number of damaged ambulances progressively increased to 115 (Figure 1).

A correlation analysis was conducted to examine the relationships between the following variables: the number of days since the onset of the attacks, the number of attacks on healthcare facilities, the number of deaths and injuries resulting from these attacks, the number of damaged healthcare facilities, the number of damaged hospitals, and the number of damaged ambulances. The analysis revealed strong positive correlations among all parameters, with statistical significance ($p<0.001$).

Table 1. Correlation analysis between the number of elapsed days, attacks, deaths, injuries and damaged healthcare facilities, hospitals, ambulances

		Elapsed days	Attacks	Deaths	Injuries	Damaged healthcare facilities	Damaged hospitals	Damaged ambulances
Elapsed days	r	1						
	p	.						
Attacks	r	0,933	1					
	p	<0,001*	.					
Deaths	r	0,952	0,995	1				
	p	<0,001*	<0,001*	.				
Injuries	r	0,881	0,957	0,955	1			
	p	<0,001*	<0,001*	<0,001*	.			
Damaged healthcare facilities	r	0,859	0,975	0,951	0,921	1		
	p	<0,001*	<0,001*	<0,001*	<0,001*	.		
Damaged hospitals	r	0,925	0,980	0,987	0,935	0,938	1	
	p	<0,001*	<0,001*	<0,001*	<0,001*	<0,001*	.	
Damaged ambulances	r	0,890	0,993	0,981	0,958	0,985	0,969	1
	p	<0,001*	<0,001*	<0,001*	<0,001*	<0,001*	<0,001*	.

*The p-values were determined based on Pearson correlation analysis. p<0.001 indicates a statistically significant correlation.

Table 2. Linear regression analysis between the number of damaged facilities and elapsed days, attacks, deaths, and damaged ambulances

	B	SE	p*	95% CI	
Elapsed days	0,214	0,048	0,007**	0,119	0,309
Attacks	0,178	0,013	0,001**	0,151	0,196
Deaths	0,275	0,031	0,011**	0,197	0,315
Damaged ambulances	0,855	0,057	0,002**	0,764	0,921

B: Regression coefficient, SE: Standard error, *: Linear regression analysis, Adjusted R^2: 0.985, **p<0.05 was considered statistically significant.

Table 3. Logistic regression analysis of the number of attacks and number of damaged healthcare facilities between the first and second 6-month periods

	B	SE	p*	OR
Attacks	0,975	133,059	0,006**	2,650
Damaged healthcare facilities	0,113	3,537	0,020**	318434,9

B: Regression coefficient, SE: Standard error, OR: Odds Ratio, Cox Snell R^2 :0,743, Nagelkerke R^2 : 0,998. *: Logistic regression analysis. **p<0.05 was considered statistically significant.

The progression of the number of damaged healthcare facilities over time is depicted in Figure 2. A rapid increase in the number of damaged facilities was observed up to the 100th day, after which the trend plateaued, indicating a stabilization in the rate of facility damage.

A linear regression analysis was performed to investigate the relationship between the number of damaged facilities and several independent variables, including the number of days since the onset of the attacks, the number of attacks on healthcare facilities, the number of deaths resulting from these attacks, and the number of damaged ambulances (Table 2). The findings indicated that the number of damaged facilities significantly predicted these variables, explaining 98.5% of the variance in the data. Specifically, each additional damaged facility was associated with an increase of 0.214 units in the number of days since the onset of the attacks (p=0.007). An increase of 0.178 units in the number of attacks on healthcare facilities was observed per additional damaged facility (p=0.001). The number of deaths increased by 0.275 units for each additional damaged facility (p=0.011). The number of damaged ambulances increased by 0.855 units per additional damaged facility (p=0.002).

Figure 3 illustrates a comparison of the number of

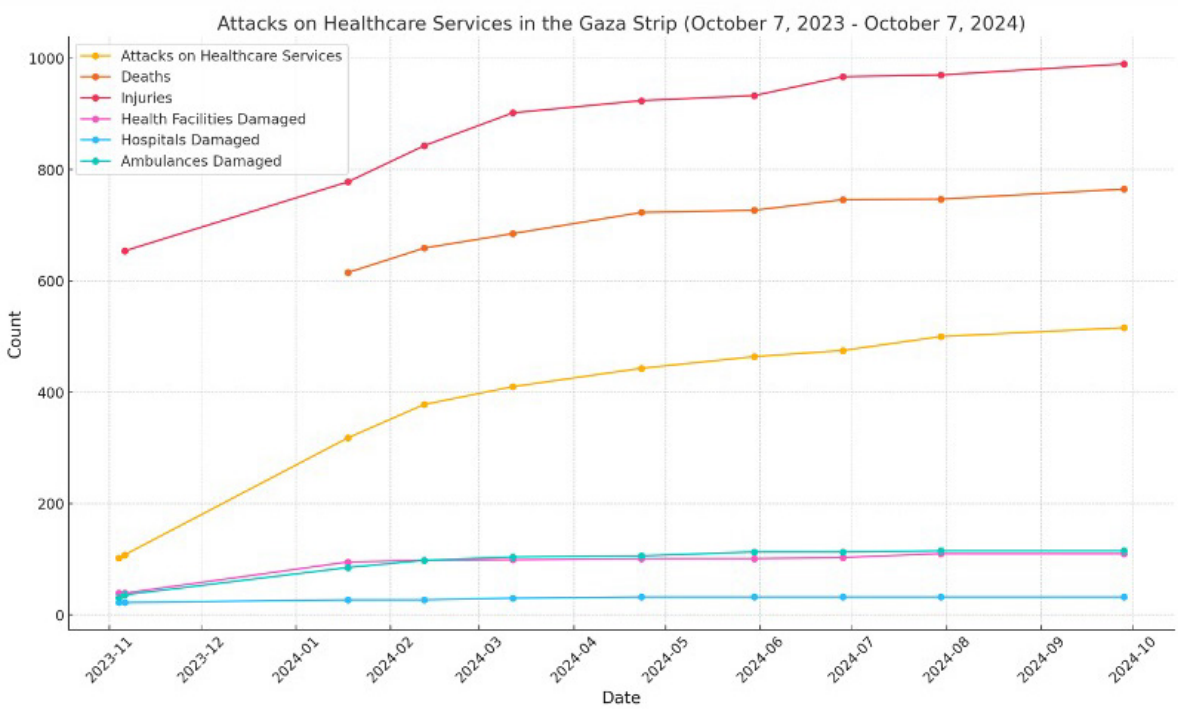

Figure 1. Attacks on healthcare services in the Gaza Strip (October 7, 2023 – October 7, 2024)

attacks on healthcare facilities and the resulting deaths across two six-month periods. The analysis revealed a reduction in both metrics during the second six-month period compared to the first.

A logistic regression analysis was conducted to compare the number of attacks on healthcare facilities and the number of damaged facilities between the first and second six-month periods (Table 3). The analysis showed that, relative to the first six months, the number of attacks on healthcare facilities decreased by 0.975 times in the second six-month period (p=0.006). The number of damaged healthcare facilities decreased by 0.113 times during the same period (p=0.020).

These findings underscore the severe impact of systematic attacks on healthcare services in the Gaza Strip and highlight temporal variations in the intensity and consequences of these attacks.

DISCUSSION AND CONCLUSION

The systematic attacks on healthcare services in the Gaza Strip have been comprehensively analyzed, revealing their multifaceted impact on infrastructure, healthcare workers, and the public health system. These attacks extend beyond physical destruction, constituting violations of international humanitarian law and ethical norms. Such deliberate targeting of healthcare institutions, medical staff, and critical medical resources aligns with the concept of medicide, which refers to the intentional dismantling of healthcare systems through systematic practices.

As highlighted by Abu El Noor et al., the significantly high prevalence of post-traumatic stress disorder (PTSD) among healthcare workers in the Gaza Strip following the 2014 attacks reflects the severe psychological toll such actions impose (17). Living under constant threat undermines trust in the healthcare system's functionality, exacerbating societal trauma and resulting in long-term mental health issues. These findings underscore how the interplay of physical destruction and psychological distress systematically weakens healthcare systems, disrupting service delivery while diminishing the resilience of both healthcare workers and the broader community they serve.

During the one-year study period, the scale of disruption to healthcare services was stark. A total of 516 attacks on healthcare facilities were recorded, resulting in 110 damaged or non-functional facilities, including

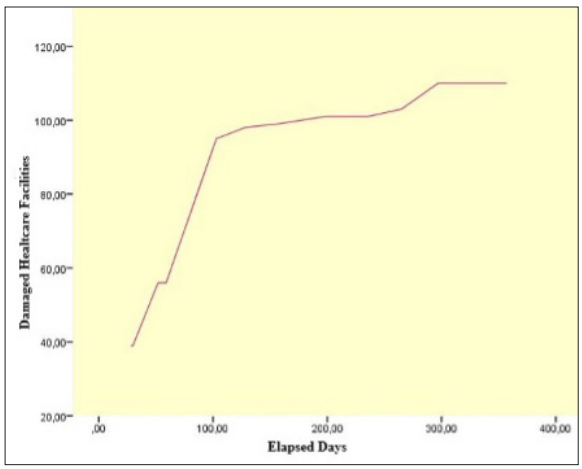

Figure 2. Relationship between number of elapsed days and damaged healtcare facilities

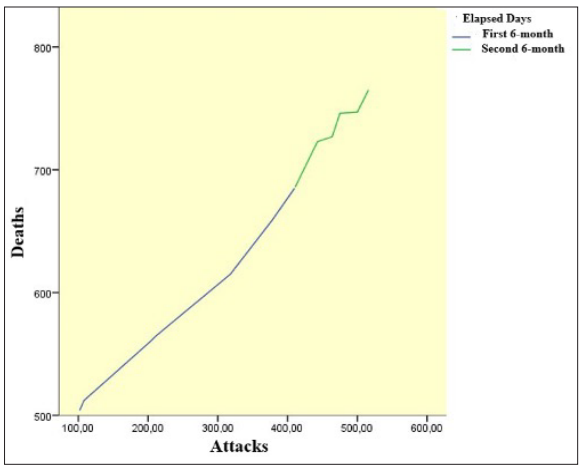

Figure 3. Relationship between the number of attacks and deaths across the first and second 6-month periods

32 hospitals. Additionally, 115 ambulances were damaged, and the human toll included 765 deaths and 990 injuries. These figures illustrate the hazardous nature of accessing healthcare in the region. As emphasized in Mahase's study, a significant proportion of hospitals in the region are either completely non-functional or operating at limited capacity. Specifically, only 7 out of 24 hospitals in North Gaza and 7 out of 12 in South Gaza remain partially operational. The critical shortage of essential medical supplies and resources exacerbates this crisis. A stark example is the Nasser Medical Complex, the largest healthcare facility in the region, which has become inaccessible due to evacuation orders and ongoing hostilities in its vicinity. The World Health Organization (WHO) reported that medical staff were forced to bury their deceased colleagues within hospital grounds. WHO's urgent calls for a ceasefire and appeals for the protection of healthcare services underscore the severity of the humanitarian crisis and the disruption of healthcare provision in the region (18). This situation highlights the international community's critical responsibility in ensuring the sustainability of healthcare systems in conflict zones.

In addition to the immediate destruction of healthcare infrastructure and loss of healthcare personnel, the attacks have had far-reaching public health consequences for the civilian population. The collapse of essential services has severely compromised access to clean drinking water, adequate sanitation, and shelter (4,5). Disruptions in immunization programs have increased the risk of outbreaks of vaccine-preventable diseases such as measles and polio (1,3). Malnutrition has risen due to limited access to food, particularly among children and pregnant women (19). The breakdown of disease surveillance systems has impeded the timely identification and management of infectious disease outbreaks, further straining the fragile health system (6,9). Access to reproductive health services has also been severely curtailed, affecting prenatal care, safe deliveries, and family planning (9). Moreover, patients with chronic conditions such as diabetes, hypertension, and cancer face significant challenges in accessing life-sustaining treatments, leading to preventable morbidity and mortality (7,15). The cumulative impact of these disruptions represents a humanitarian emergency that extends beyond physical injury, severely undermining the well-being and resilience of the population (1,19). Addressing these public health challenges requires a coordinated international response that includes both immediate relief efforts and long-term strategies for rebuilding and strengthening public health infrastructure (3,10).

Attacks on healthcare services have progressively intensified their impact on various components of the healthcare system, posing a multidimensional threat. This study underscores the critical need for enhanced emergency preparedness, echoing the findings of Hamshari et al., who advocate for policy strategies prioritizing emergency response (20). This research demonstrates that such attacks not only damage physi-

cal infrastructure but also severely impair service delivery capacity and emergency response mechanisms. Additionally, inadequate investments in health infrastructure and human resources are shown to weaken emergency preparedness, particularly in the context of long-term consequences. Both this study and Hamshari et al. highlight the shared concern over damage to critical components such as ambulance services, emphasizing that the lack of adequately equipped ambulances undermines emergency response capacity (20). Similarly, shortages of essential medical equipment expose the system's vulnerabilities. These findings stress the importance of developing comprehensive, long-term policies to prevent attacks on healthcare services and mitigate their far-reaching impacts.

The systematic daily increase in attacks on health infrastructure underscores the extreme vulnerability of healthcare systems in conflict zones. In particular, the deliberate targeting of healthcare facilities and ambulances in the Gaza Strip has severely hindered access to essential healthcare services, pushing the system to the brink of collapse (11). Similarly, this study's findings indicate that such attacks exacerbate existing health crises and pose a long-term threat to the sustainability of healthcare delivery. The impacts of these attacks extend beyond physical destruction; they also erode public trust in healthcare services, resulting in significant psychosocial consequences. Kınık et al. emphasized in their study that the psychological trauma experienced by healthcare workers and patients destabilizes the integrity of the healthcare system (11). Consistent with the literature, this study demonstrates that recovery from such destruction and disruption is highly challenging and often leads to enduring public health consequences.

Observations on the increasing number of damaged healthcare facilities over time reveal that health infrastructure is directly impacted by attacks, following a fluctuating trajectory throughout the conflict period. A sharp rise in damaged healthcare facilities within the first 100 days indicates that attacks were heavily concentrated in the early stages, suggesting a deliberate strategy to target healthcare infrastructure. The plateau observed after the 100th day could indicate either a decrease in the intensity of attacks or a limitation in the capacity for further destruction of healthcare infrastructure. In their study, Kınık et al. examined the period from October 7 to December 30, 2023, and emphasized the escalation of attacks in October, highlighting that healthcare workers were among the most affected groups—a clear indication of an intentional effort to undermine critical components of the healthcare system (11). The obstruction of access to primary healthcare services further supports the notion that these services were systematically and intentionally targeted. Similarly, Alser et al. documented the systematic nature of these attacks, citing the bombing and subsequent military occupation of Nasser Hospital, which rendered it completely inoperative (21).

Arawi describes this violence as an "open war against healthcare services," stressing its profound humanitarian consequences at both local and global levels. The 364 recorded attacks on healthcare services between October 7 and December 7, 2023, highlight the extensive scale of this campaign and underscore the long-term repercussions of deliberately targeting healthcare infrastructure (22). The findings suggest that in conflict zones, attacks on healthcare systems are often concentrated in the early stages to inflict maximum damage—a strategy frequently observed in such settings. The initial rapid increase in damage, followed by a plateau, provides critical insights into the resilience of healthcare systems during crises, as well as their capacity for recovery and reconstruction. This study underscores the importance of early international humanitarian interventions to mitigate the impacts of these attacks, emphasizing the need for timely and coordinated responses to protect healthcare systems in conflict settings.

The strong association between the number of damaged healthcare facilities and variables such as deaths and injuries underscores the multidimensional and persistent impacts of these attacks on healthcare systems. Notably, the deliberate targeting of ambulance services severely compromises emergency response capacity, leading to increased casualties and disrupting the continuity of healthcare services. The direct correlation between the rise in damaged facilities and human losses highlights the devastating scale of these assaults on healthcare infrastructure. Kınık et al. emphasized in their study that attacks on health-

care facilities, ambulances, and medical staff result in the destruction of critical infrastructure, shortages of medical supplies, and a lack of healthcare personnel. These effects collectively undermine the sustainability of healthcare services and create multilayered, long-lasting consequences (11). Ensuring the protection of healthcare services and maintaining the delivery of emergency medical services are essential to preserving humanitarian values in conflict settings.

The first six months of intensive attacks on healthcare infrastructure, followed by a relative decline in the subsequent six months, necessitate a multidimensional assessment of these attacks, particularly their impact on mortality and morbidity rates. International public outcry is believed to have significantly contributed to the reduction in attacks. Khatib et al. argue that media coverage, advocacy by civil society organizations, and pressure from international institutions may have compelled aggressor parties to reconsider their strategies (23). However, despite the decrease in attack intensity, persistently high mortality rates reflect the enduring consequences of the structural damage inflicted on healthcare infrastructure, which cannot be mitigated by public reaction alone.

Other factors contributing to the decline in attacks include shifts in the conflict's dynamics, political negotiations, and changes in military strategies (23). This reduction in attack intensity offers an opportunity to begin reconstructing the healthcare infrastructure. However, addressing the extensive damage requires long-term planning and strong international cooperation. Additionally, the decline in attacks may partly result from the reduced number of functional healthcare facilities and ambulances, many of which have been rendered inoperative. This structural devastation has weakened access to healthcare services and emergency response capacity, perpetuating high mortality rates. Farhan et al. emphasize that restricted access to healthcare services, combined with other humanitarian crises such as food insecurity, water scarcity, and displacement, has further exacerbated conditions in the region (19). Similarly, Qandil highlights that Gaza's healthcare system continues to face significant challenges. The inadequacy of emergency medical services, persistent resource shortages caused by ongoing attacks, heavy workloads, and the psychological trauma experienced by healthcare professionals have all negatively impacted the quality of healthcare services, contributing to sustained high mortality rates (24).

Attacks on healthcare infrastructure in conflict zones extend beyond physical destruction, representing violations of international law and human rights. These acts, defined as medicide, involve the systematic targeting of medical infrastructure, services, and personnel, carrying significant medical and legal implications. This study highlights the urgent need for international recognition of medicide and the role of public outcry in shaping effective preventive measures.

Such attacks constitute crimes under international law, aiming to dismantle healthcare systems and jeopardize global health security. Preventing medicide requires raising public awareness, strengthening international mechanisms, building resilient healthcare infrastructure, and enhancing local crisis management capacities. Protecting healthcare systems is not only essential for affected populations but also a strategic imperative for global health security.

The case of Gaza underscores the systematic destruction of healthcare facilities, ambulances, and medical personnel, violating ethical norms and crippling all components of the healthcare system. These attacks exacerbate public health crises and threaten global stability, making immediate and coordinated international action indispensable.

This study has certain limitations. The retrospective reliance on open-source data may have led to the exclusion of unreported incidents, and field conditions likely constrained data collection. Additionally, the cross-sectional design limits the ability to assess the long-term impacts of the attacks. Future research should prioritize examining the prolonged effects of such attacks on healthcare system sustainability to inform more effective policy recommendations.

The systematic attacks on healthcare services in the Gaza Strip represents a significant threat to public health and a stark violation of international humanitarian law. This study highlights the profound and multifaceted impacts of these attacks, including the disruption of healthcare infrastructure, the loss of lives, and the erosion of trust in health systems. By analyzing a one-year period of conflict, the findings underscore the urgent need for strengthened in-

ternational efforts to safeguard healthcare services in conflict zones. While these observations reveal the severity of the challenges faced, they also point to the importance of developing comprehensive policies aimed at protecting health systems and ensuring resilience against future threats. Addressing these issues is critical not only for the affected populations but also for upholding humanitarian principles and promoting global health security.

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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