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Health Management in War and Post-War Crises

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Authors
Mazhari S.R.[1] *MD, PhD*
Najari A.[1] *MD, PhD*
Sobhani Z.[1] *MSc*
Yarahmadi A.[2] *MSc*
Latifi M.[*1] *PhD*

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[1]Center of Statistics and Information Technology Management, Ministry of Health and Medical Education, Tehran, Iran
[2]Ministry of Health and Medical Education, Tehran, Iran

Correspondence
Address: 5th Floor, Block A, Ministry of Health, Treatment and Medical Education, Ivanek, Tehran, Iran. Postal Code: 1467664961
Phone: +98 (21) 81453698
mercede_latifi@yahoo.com

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ABSTRACT

Aims Armed conflicts and post-conflict crises severely disrupt health systems, exacerbate health inequities, and undermine service delivery. This study aimed to systematically review global evidence on health management in war and post-conflict settings and to identify emerging priorities for applied research and policy guidance.

Information & Methods This systematic review was conducted in accordance with the PRISMA 2020 guidelines. A comprehensive search was performed in PubMed/MEDLINE, Scopus, and Web of Science for peer-reviewed studies published between 2015 and 2025. Quantitative, qualitative, and mixed-method studies examining health management interventions, strategies, and system-level responses in war and post-conflict contexts were included. Study selection and data extraction were independently conducted by two reviewers. Of the 900 records identified, 87 studies met the inclusion criteria.

Findings Health management in war and post-conflict crises was structured around nine interrelated domains, including health policy and governance, healthcare service delivery, mental health and psychosocial support, health of vulnerable populations, health information systems and digital technologies, health economics and equity, health workforce education and capacity-building, health system resilience and reconstruction; and legal, ethical, and humanitarian frameworks.

Conclusion Effective health management in war and post-conflict settings requires integrated, adaptive, and evidence-based approaches addressing both immediate humanitarian needs and long-term system recovery.

Keywords War; Life Crises; Health Information Management; Health Priorities

CITATION LINKS

[1] The impact ... [2] Brain injury ... [3] Decision support ... [4] Enhancing ... [5] Turf wars ... [6] Beyond the ... [7] Danger! Crisis ... [8] One year ... [9] Invisible harm ... [10] Changing ... [11] Progress in ... [12] The effect ... [13] Rebuilding Gaza's ... [14] Death anxiety ... [15] Mental health ... [16] Outpatient ... [17] Resisting epistemic ... [18] Mapping mental ... [19] Stakeholder ... [20] The human ... [21] Understanding ... [22] Impact of ... [23] "... because ... [24] Psychological ... [25] Improving ... [26] Ukraine trauma ... [27] Agent orange ... [28] Changes in ... [29] Implementing ... [30] Who can ... [31] Conflict ... [32] Rebuilding ... [33] Diphtheria ... [34] A syndemic ... [35] The effect ... [36] Before the ... [37] Epidemiology ... [38] Professional ... [39] Road traffic ... [40] Vaccination status ... [41] "Will you ... [42] The extent ... [43] Retention ... [44] The effectiveness ... [45] Changes in ... [46] Real-time ... [47] Effectiveness ... [48] Midwives' experiences ... [49] Risk factors ... [50] Shared war ... [51] Syrian crises ... [52] Changes in ... [53] Determining the ... [54] Chronic traumatic ... [55] A mathematical ... [56] Women of ... [57] Breast cancer ... [58] Risk factors ... [59] The impact ... [60] Causes and ... [61] Prevalence ... [62] Renewable ... [63] Vaccination ... [64] Neural tube ... [65] Intestinal parasitic ... [66] Are people ... [67] HIV-positive ... [68] Acute complications ... [69] Prevalence ... [70] Results from ... [71] Barriers to ... [72] Burns in ... [73] Low uptake ... [74] Contraceptive ... [75] War-related ... [76] Integrating ... [77] Struggling to ... [78] Prevalence of ... [79] Problematic ... [80] Dynamics of ... [81] From conflict ... [82] Risk factors ... [83] Physical and ... [84] Measles in ... [85] Maternal mental ... [86] Responding ... [87] Disability of ... [88] Association of ... [89] Risk factors ... [90] "There is ... [91] Medical education ... [92] Healthcare ... [93] Armed conflict ... [94] An analytic ... [95] How sexual ... [96] Prevalence of ... [97] The role ... [98] Prevalence and ... [99] The challenge ... [100] Changes in ... [101] A predictive ... [102] Health system ... [103] Access to ... [104] Managing a ... [105] Between war ... [106] Infectious disease ... [107] "The professionals ... [108] Sociocultural ... [109] Human ... [110] Maternal ... [111] Implementation ... [112] Conflict-driven ... [113] Understanding ... [114] Cybersecurity ... [115] Sustainable ... [116] War and ... [117] War, displacement ... [118] Prolonged multisectoral ... [119] Profiling PTSD ... [120] Ethical ... [121] Health workforce ... [122] Resilience and ... [123] International technical ... [124] International ... [125] Humanity ... [126] The application ...

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Introduction

Armed conflicts, as one of the most complex challenges facing health systems in the contemporary century, not only result in direct human casualties but also leave profound and long-lasting effects on population health through the destruction of health infrastructure, disruption of pharmaceutical and medical supply chains, and erosion of the health workforce [1]. Over the past two decades, the nature of armed conflicts has undergone a significant transformation; modern wars increasingly occur in urban and densely populated areas, deliberately target civilians, and systematically devastate essential infrastructure, including healthcare facilities [2, 3]. These developments have rendered health management in wartime conditions markedly more complex and challenging [4].

According to a recent report by the World Health Organization, more than 70% of war-related mortality results from disruptions in the delivery of essential health services rather than direct combat injuries [5, 6]. This statistic underscores that the impacts of armed conflicts on health indicators extend far beyond acute trauma and manifest through the collapse of primary care systems, the resurgence of preventable diseases, the exacerbation of the burden of non-communicable diseases, and the emergence of long-standing psychosocial crises [7–9]. A study published in The Lancet demonstrates that in countries experiencing prolonged conflict, health indicators may take decades after the cessation of hostilities to return to pre-war levels [10].

The health consequences of armed conflicts can be examined at three levels. The first level includes direct effects, such as war-related trauma, injuries, and disabilities. The second level encompasses indirect effects, including disruptions in access to primary healthcare, maternal and child health services, and disease prevention and control programs, and the third level comprises structural consequences, including the destruction of health systems, the loss of human capital, and the weakening of health governance. These three interrelated layers form a vicious cycle that requires multilayered, integrated interventions to be broken effectively [11-14].

Despite the expansion of studies in this field over the past decade, the existing literature suffers from methodological fragmentation. This fragmentation not only impedes the development of effective policies but also complicates the comparison and synthesis of findings. Moreover, the significant gap between academic research and the practical needs of conflict settings has led many real-world interventions to lack the necessary effectiveness and sustainability.

Humanitarian organizations are often forced to act on practical experience with insufficient scientific grounding, while academic research frequently remains confined to scholarly publications and fails to translate into practice.

One of the main challenges in this field lies in the dynamic and evolving nature of contemporary conflicts. Modern wars are characterized by prolonged duration, asymmetric tactics, intentional targeting of healthcare facilities, and the deployment of new weaponry. These characteristics have transformed health management in war settings into a domain that requires continuous reassessment and up-to-date knowledge.

This systematic review sought to synthesize and critically analyze existing evidence and to propose a comprehensive, structured framework for health management during war and post-conflict crises. The primary goal was to identify emerging research priorities in this domain and develop a roadmap to guide future applied research, serving as an efficient tool for policymakers, health system managers, and humanitarian organizations to design evidence-based, impactful responses in the most critical circumstances.

Information and Methods

This systematic review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The population, intervention, comparator, outcomes, and study design (PICOS) framework was defined, with the population comprising communities and human groups affected by war and post-conflict crises. The intervention comprised strategies and interventions related to health management, including physical, psychological, social, and organizational aspects. The comparator was the absence of intervention or, when applicable, alternative interventions. Outcomes focused on improvements in physical and mental health, rehabilitation, strengthening of the health system, equity in access, health resilience, and related measures.

The study design encompassed quantitative, qualitative, and mixed-method studies.

Data were collected through a systematic search of leading international scientific databases, including PubMed/MEDLINE, Scopus, and Web of Science (WoS). The search strategy was developed using a combination of keywords and relevant MeSH terms and included TS= ("Health Management" OR "Healthcare Management" OR "Health Services Management" OR "Health Services Administration" OR "Health Policy" OR "Health Planning" OR "Health System*" OR "Healthcare System*" OR "Medical Services" OR "Health Governance") AND ("War" OR "Warfare" OR "Armed Conflict*" OR "Military Medicine" OR "Combat Zone*" OR "Battlefield*" OR "Post-Conflict" OR "Wartime" OR "War-related" OR "Post-Armed Conflict* Health Crisis" OR "Post-war Health Crisis").

Inclusion criteria were English-language studies examining health management in war and post-conflict crises published between 2015 and 2025, quantitative, qualitative, and mixed-method studies, and original research published in reputable journals with full-text availability.

Articles focusing solely on short-term war outcomes without addressing the post-conflict phase, articles without full-text access, and non-scientific studies or those lacking a clear methodological framework were not included.

The data analysis process was conducted in two stages. Stage 1 was the screening and selection of studies, carried out independently by two researchers in three steps: screening titles and abstracts, full-text review of eligible studies, and resolution of disagreements through consultation with a third researcher. EndNote X9 software was used to manage references and remove duplicates. Stage 2 was data extraction using a standardized extraction form developed by the research team. Extracted information included bibliographic characteristics of the study (author, year of publication, country), study design and methodology, study population and research context, type of health intervention and management strategies (if applicable), measured outcomes, and main findings. Of the 900 studies initially identified, 87 met the inclusion criteria and were selected for the review (Figure 1).

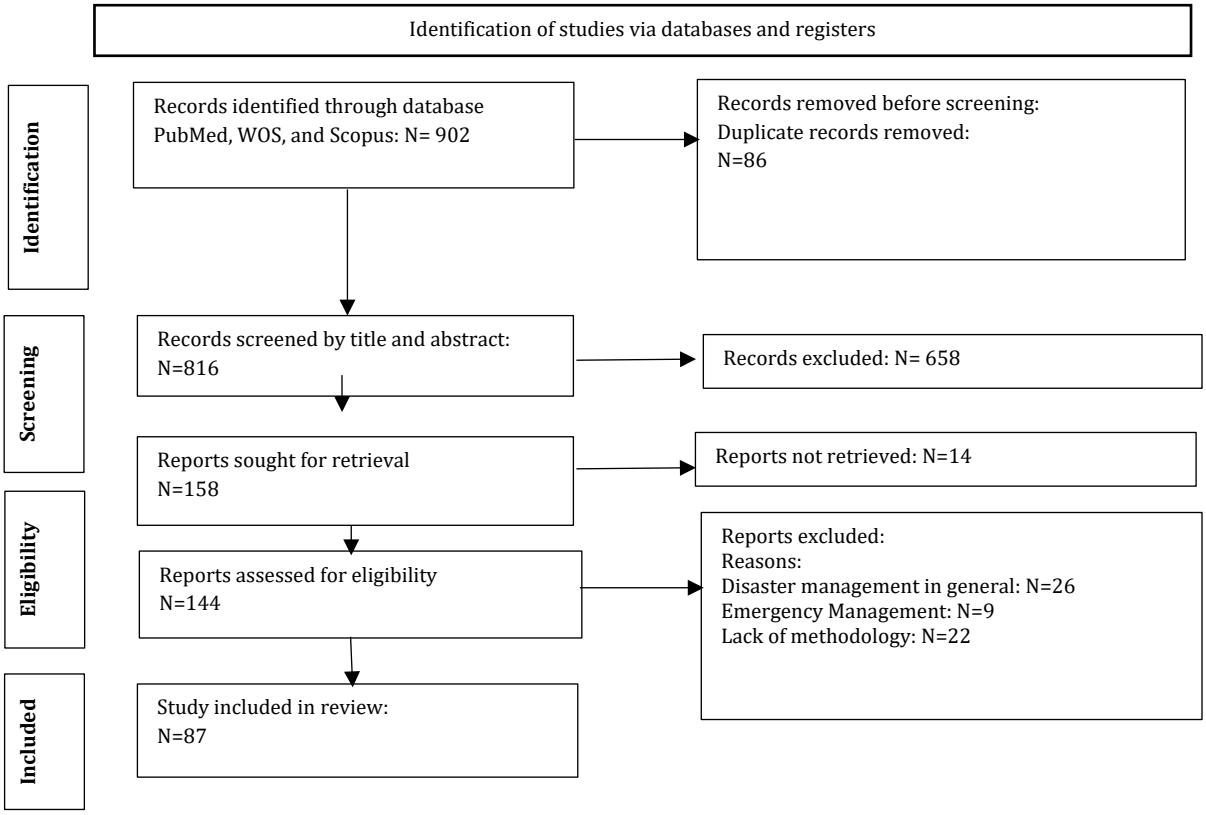

Figure 1. Screening and selection process of studies using the PRISMA flow diagram.

Findings

The collapse or severe weakening of health governance was a recurring pattern across all geographical regions [15–20]. Disruptions in policy formulation, fragmented leadership, lack of coordination among key actors (governments, military structures, and humanitarian organizations), and breakdowns in pharmaceutical and medical supply chains directly undermined service delivery capacity and led to inefficient resource allocation during crises [15, 18, 21–32]. These findings underscore the critical need for pre-established, flexible, and conflict-sensitive health governance mechanisms capable of sustaining core system functions during war and facilitating recovery in the post-conflict phase [27, 33-44].

A sharp increase was observed in demand for emergency and trauma care, coupled with the collapse of routine and preventive services, including immunization, maternal and child healthcare, and continuity of care for non-communicable diseases [45–51]. These patterns have significant operational implications, emphasizing the necessity of adaptive service delivery models such as field hospitals, mobile clinics, surge capacity planning, and the strategic strengthening of primary healthcare as the backbone of wartime service provision [52-59].

Regarding mental health and psychosocial interventions, there was a consistently high prevalence of psychological disorders and point to the relative effectiveness of community-based and digitally enabled interventions [60–67]. From an

implementation standpoint, integrating mental health services into primary healthcare packages and leveraging low-cost digital platforms can enhance system responsiveness and coverage in resource-constrained and insecure environments [20, 32, 63, 68, 69]. Regarding vulnerable populations, women, children, older adults, and persons with disabilities disproportionately bear the health consequences of armed conflict [19, 60, 67, 70–73]. Operationally, this necessitates targeted programming, explicit prioritization in resource allocation, and continuous monitoring of equity indicators to prevent the widening of health disparities during and after conflict [74-77].

Health information systems and digital technologies play a compensatory role in maintaining service continuity during conflict [26, 75, 78–81]. However, challenges related to data quality, interoperability, cybersecurity, and infrastructure sustainability impose substantial operational constraints [62, 63, 82–85]. Finally, fragmented or short-term interventions were insufficient. Sustainable impact required integrated, evidence-based strategies aligned across all system components (Table 1) [64, 86-97].

Table 1. Summary of the key findings from the included studies (M: Middle East; A: Africa; EA: Europe/Asia; AO: America/Other)

Category	Subcategory	M	A	EA	AO	Result(s)
Health policy and strategic governance	- Intersectoral coordination - Resource allocation and prioritization - Pharmaceutical supply chain governance - Health financing in crises - Surveillance of war-related diseases and injuries - International legal and policy challenges	[10, 33, 39, 49, 51, 56, 58, 84, 88]	[19, 22, 30-32, 34, 35, 42, 43, 60, 73, 76, 78, 91, 94]	[20-25, 27-29, 36-38, 40, 41, 44, 77, 83, 92, 93]	[15-18, 68, 82, 90]	- Conflict disrupts health governance, causing fragmented leadership and decision-making. - Supply chain breakdowns and infrastructure damage hinder consistent, equitable services. - Lack of conflict-sensitive policies leads to inefficiency, delays, and weak accountability. - Adaptive, legal, and cross-sector governance is vital for health during and after conflict.
Management of healthcare services	- Emergency and trauma care - Triage systems and surge capacity - Mobile clinics & field hospitals - Continuity of care for chronic diseases - Epidemic control and vaccination - Access to essential medicines - Strengthening primary healthcare	[10, 33, 39, 49, 51-59, 61-63, 72, 88, 97]	[19, 30-32, 34, 35, 42, 43, 45, 73, 85, 94, 96]	[20, 24, 27, 29, 36, 37, 40, 41, 46-48, 50, 75, 77, 81, 93]	[15, 17, 18, 82, 90, 95]	- Conflict creates high demand for trauma care while disrupting routine and chronic health services. - Emergency systems and access to medicines face severe operational challenges. - Immunization and disease surveillance disruptions lead to outbreaks of preventable diseases. - Mobile clinics and adaptive delivery models are key to sustaining health services during war.
Mental health and psychosocial interventions	- PTSD, anxiety, and depression - Community-based interventions - Integration of mental health into PHC - Digital mental health services - Psychosocial rehabilitation - Long-term mental health impacts	[10, 49, 52, 56, 61-63, 71, 72]	[32, 60, 64, 66, 69, 85, 89, 94]	[20, 22, 23, 36, 38, 46, 47, 65, 67, 75, 77, 80, 81, 83, 87]	[15-17, 68, 90]	- Conflict causes high rates of PTSD, anxiety, depression, and distress among civilians, combatants, & healthcare workers. - Community-based psychosocial interventions improve mental health access & cultural relevance in insecure settings. - Digital mental health tools help mitigate service disruptions and expand coverage during conflict. - Integrating mental health into primary care and emergency response is essential during and after conflict.
Health of vulnerable populations	- Maternal and neonatal health - Child health and nutrition - Childhood immunization - Refugees and internally displaced populations - Older adults and persons with disabilities - Gender-based violence	[10, 33, 52, 56-58, 62, 63, 71, 72, 84, 88, 99]	[19, 31, 66, 70, 73, 74, 76, 89, 91, 98]	[22-28, 37, 38, 44, 77, 83, 86, 93]	[15-18, 68, 90]	- Vulnerable groups (women, children, elderly, disabled) suffer disproportionately from conflict-related health impacts. - Disrupted maternal and neonatal services increase mortality and unsafe deliveries. - Child malnutrition, reduced vaccinations, and exposure to violence are common in conflict zones. - Targeted, equity-focused programs and monitoring are essential to address these disparities.
Health information systems and technology	- Health information systems in crises - Disease surveillance and rapid reporting - Telemedicine - Data quality and interoperability - Cybersecurity and data protection	[33, 51, 52, 55, 57, 62, 63]	[43, 78, 85]	[26, 29, 38, 47, 50, 75, 79-81, 83]	[82, 90, 95]	- Health information systems support service continuity through remote care and real-time monitoring during conflict. - Telemedicine helps overcome access barriers from infrastructure damage and displacement. - Data quality, interoperability, cybersecurity, and infrastructure challenges limit effectiveness. - Conflict-resilient, secure, and ethical health information systems are urgently needed.
Health economics and equity	- Health financing during conflict - Catastrophic health expenditures - Inequities in access to care - Economic impacts of displacement - Health equity	[51, 55, 71, 72, 75, 84, 88, 99]	[19, 30, 32, 34, 35, 42, 43, 45, 91]	[20, 25, 26, 37, 38, 50, 79, 81, 83, 87]	[15-17, 68, 82]	- Conflict increases financial hardship, causing catastrophic health costs and poverty. - Displacement and damaged facilities limit equitable access to care. - Current financing systems struggle to meet crisis-driven health demands. - Equity-focused financing, crisis insurance, and global aid are crucial to reduce inequalities.

Continue of Table 1 from the last page.

Education, capacity-building, and health workforce empowerment	- Health workforce shortages - Emergency and short-term training - Interprofessional education - Occupational health of health workers - Workforce motivation and sustainability - Ethical challenges for health professionals	[39, 49, 51, 56, 59, 71, 72, 83, 97, 100]	[32, 64, 69, 91, 94]	[25, 27, 37, 46, 47, 86, 87, 92, 93]	[17, 68, 82, 90, 95]	- Conflict drives health worker loss via burnout, migration, violence, and poor conditions. - Staff shortages reduce care quality and system resilience, especially in frontline/rural areas. - Rapid, context-specific training helps sustain frontline services. - Psychological and occupational support is vital for workforce sustainability.
Health system resilience and reconstruction	- Health infrastructure reconstruction - Health system resilience - Hospital surge capacity - Emergency preparedness - International cooperation	[33, 49, 51, 53, 56, 57, 59, 61, 62, 71, 97]	[34, 42, 43, 45, 66, 78, 85, 89, 96]	[25, 27, 38, 41, 46, 52, 79, 86, 92]	[15-18, 67, 68, 82, 90, 95]	- Health infrastructure destruction hinders service recovery and system function post-conflict. - Rebuilding requires ongoing investment in infrastructure, workforce, and institutions. - International support is key for resource mobilization and evidence-based reconstruction. - Resilience should be integrated into preparedness, wartime response, and recovery.
Legal frameworks, ethics, and international & humanitarian collaboration	- Legal protection of healthcare services - International humanitarian law - Ethics of wartime triage - Humanitarian coordination - Health diplomacy	[49, 52, 54, 57, 61-63, 71, 72]	[74, 76, 78, 91]	[37, 40, 44, 47, 77, 80, 86]	[68, 90, 95]	- Attacks on health facilities and workers violate the law and weaken health systems. - Poor accountability and enforcement sustain insecurity for providers and patients. - Humanitarian coordination issues cause service overlap and resource inefficiency. - Ethical challenges in conflict care require stronger legal and ethical frameworks.

Table 2. The thematic framework of health management in war and post-conflict crises

1. Health management in war and post-conflict crises
1.1. Health policy and strategic governance
1.1.1. Analysis of health governance structures in wartime and post-conflict crises
1.1.2. Review of country experiences in developing war-oriented health policies
1.1.3. Feasibility study on establishing health policy units for wartime management
1.1.4. Analysis of legal and international challenges in wartime health management
1.1.5. Evaluation of intersectoral coordination (Military, Health System, Red Crescent, etc.)
1.1.6. Study of resource allocation methods under wartime constraints
1.1.7. Examination of prioritization models for wartime health services
1.1.8. Analysis of global experiences in managing pharmaceutical and equipment resources
1.1.9. Feasibility study of creating a strategic database of critical health resources
1.1.10. Analysis of national policy responses in recent armed conflicts
1.1.11. Feasibility of developing a national plan for wartime health crisis management
1.1.12. Surveillance systems for war-related diseases and injuries during and after conflict
1.1.13. Security and confidentiality of health data during armed conflicts
1.1.14. Migration, displacement, and their impacts on population health
1.1.15. Evaluation of health financing systems in wartime
1.2. Management of healthcare services
1.2.1. Study of rapid trauma response models in battlefield conditions
1.2.2. Review of training and empowerment of frontline personnel for first aid
1.2.3. Analysis of the effectiveness of triage systems in war
1.2.4. Feasibility study of deploying mobile and field hospitals
1.2.5. Evaluation of emergency surgical protocols in resource-limited settings
1.2.6. Analysis of epidemic emergence and control in war and post-conflict conditions
1.2.7. Examination of consequences of treatment disruptions for chronic patients
1.2.8. Feasibility study on digital health services for wartime patients
1.2.9. Evaluation of emergency vaccination interventions
1.2.10. Analysis of disease surveillance systems and post-conflict weaknesses
1.2.11. Study of substance use disorders and addiction-related issues after war
1.2.12. Burden of cardiovascular diseases, diabetes, and cancer in post-conflict settings
1.2.13. Analysis of access to non-communicable and communicable disease services
1.2.14. Crisis of access to essential medicines after war
1.2.15. Assessment of the role of primary health care in strengthening wartime health systems
1.3. Mental health and psychosocial interventions
1.3.1. Study of mental health among military personnel and civilians
1.3.2. Epidemiological study of PTSD, anxiety, depression among survivors, combatants, and affected groups in war and post-war phases
1.3.3. Examination of psychological impacts of war on children, women, and older adults
1.3.4. Feasibility study on mobile mental health clinics
1.3.5. Evaluation of the effectiveness of short-term psychosocial interventions
1.3.6. Analysis of long-term mental health consequences of war at the societal level
1.3.7. Study of social support models for war survivors
1.3.8. Analysis of successful psychosocial rehabilitation experiences
1.3.9. Feasibility study of telephone/online counseling services in wartime
1.3.10. Design of community-based interventions to enhance resilience
1.3.11. Review of post-war mental health services

Continue of Table 2 from the last page.

1.4. Health of vulnerable populations
1.4.1. Study of women's health and reproductive health in war and post-conflict settings
1.4.2. Examination of challenges in maternal care during and after conflicts
1.4.3. Analysis of access to safe delivery services in conflict zones
1.4.4. Feasibility study of mobile maternal and child health clinics
1.4.5. Analysis of population-level impacts of disrupted reproductive health services
1.4.6. Assessment of children's specific health needs in conflict situations
1.4.7. Review of malnutrition outcomes and incomplete immunization
1.4.8. Study of special care needs for older adults and people with disabilities in wartime
1.4.9. Feasibility study of vaccination programs for vulnerable populations post-war
1.4.10. Prevalence of malnutrition among children and mothers during and after conflict
1.4.11. Review of health rights of vulnerable groups within international frameworks
1.5. Health information systems and technology
1.5.1. Study on designing a wartime health events registry system
1.5.2. Evaluation of the efficiency of rapid reporting systems
1.5.3. Analysis of data quality under crisis conditions
1.5.4. Feasibility study on developing conflict-oriented managerial dashboards
1.5.5. Evaluation of the role of artificial intelligence in real-time surveillance
1.5.6. Assessment of telemedicine effectiveness for wartime health services
1.5.7. Feasibility study on the use of drones in pharmaceutical logistics
1.5.8. Evaluation of the application of robots and automated equipment in emergency response
1.5.9. Examination of cybersecurity infrastructure in wartime health systems
1.5.10. Analysis of ethical and legal implications of health technologies in war
1.6. Health economics and equity
1.6.1. Cost-effectiveness analysis of wartime health services
1.6.2. Examination of health financing models in armed conflicts
1.6.3. Feasibility study of crisis health insurance
1.6.4. Evaluation of indirect costs (disability, displacement, migration)
1.6.5. Analysis of the economic sustainability of health systems during war
1.6.6. Assessment of inequities in access to health services in conflict settings
1.6.7. Human rights-based examination of access to health in wartime
1.6.8. Evaluation of gender equity in access to health services
1.6.9. Analysis of the role of international organizations in reducing inequities
1.6.10. Analysis of supportive policies for vulnerable populations
1.7. Education, capacity-building, and health workforce empowerment
1.7.1. Needs assessment of health workforce training in war
1.7.2. Evaluation of the effectiveness of short-term training for first responders
1.7.3. Analysis of interprofessional education (physicians, nurses, paramedics) in conflict settings
1.7.4. Feasibility study of online education in wartime conditions
1.7.5. Assessment of the role of simulators in crisis training
1.7.6. Examination of volunteer health workforce mobilization models
1.7.7. Analysis of workforce sustainability in conflict zones
1.7.8. Study of motivational and supportive policies for health workers in wartime
1.7.9. Evaluation of occupational health of frontline workers
1.7.10. Post-war health workforce shortage and migration
1.7.11. Examination of ethical challenges confronting health workers in war
1.8. Health system resilience and reconstruction
1.8.1. Resilience models for emergency and critical care systems
1.8.2. Reconstruction of destroyed health infrastructure
1.8.3. International collaborations for health system reconstruction
1.8.4. National health drills for wartime scenarios
1.8.5. Pathology of health facility destruction and reconstruction
1.8.6. National health drills for wartime scenarios
1.8.7. Hospital surge capacity for mass war casualties
1.9. Legal frameworks, ethics, and international & humanitarian collaboration
1.9.1. Examination of international obligations in wartime health
1.9.2. Ethical analysis of wartime triage practices
1.9.3. Study of humanitarian law governing access to health services
1.9.4. Review of ethical issues in the use of emerging technologies
1.9.5. Analysis of the role of human rights bodies in wartime health
1.9.6. Study of successful models of health collaboration in armed conflicts
1.9.7. Examination of coordination challenges among humanitarian organizations
1.9.8. Analysis of WHO and ICRC experiences in wartime health management
1.9.9. Evaluation of the role of health diplomacy in armed conflicts
1.9.10. Assessment of the implementation of the Geneva Conventions in the health sector
1.9.11. Feasibility study of establishing a regional network for wartime health

A thematic tree was built to provide a comprehensive conceptual framework for the field of health management in war and post-conflict crises. The sequence of topics and subtopics within this structure did not reflect any inherent hierarchy or prioritization among them. Rather, it is designed solely to facilitate systematic classification and to enhance the understanding of the complexity and multidimensionality of this field. All levels and components are equally important, interacting

dynamically and interdependently to form an integrated, holistic perspective essential for managing health in the face of this major global challenge.

Health management in conditions of armed conflict requires a systemic, multi-level perspective in which policy-making, service delivery, human resources, health technology, health economics, and legal considerations dynamically and reciprocally influence one another. Each branch represents an independent intervention domain that is nevertheless highly interdependent with the other domains.

For example, the branch of health governance and policy-making functions as the backbone of the system, and its decisions directly affect the efficiency of service delivery, resource allocation, and intersectoral coordination. In the absence of effective governance, even technically sound interventions are likely to fail. The health services management branch emphasizes an operational focus on rapid response, continuity of essential services, and adaptability to resource constraints.

The sustainability of the health system was not solely dependent on physical infrastructure but also on human and social capital, which play a decisive role. From an implementation perspective, this underscores the necessity of simultaneous investment in the training, psychological support, and motivation of health personnel (Table 2).

Discussion

This systematic review synthesized empirical evidence from 87 studies conducted between 2015 and 2025 across various domains of health management during war and post-conflict crises in countries such as Yemen, Syria, Ukraine, Afghanistan, the Democratic Republic of Congo, Ethiopia/Tigray, Somalia, Iran, Iraq, Israel, Colombia, Sierra Leone, and others. There were complex, multidimensional challenges, and several priority areas were identified for policy-making, practice, and future research.

Health management in war and post-conflict crises was structured around nine major thematic domains. In the area of health policy and governance, the collapse or severe disruption of health governance structures during wartime and in the post-conflict period is a consistent finding across all settings—from Yemen and Syria to Ukraine [47, 101, 102]. Some studies highlight the fragmentation of health authority, disruptions in the supply chain of essential medicines, and the destruction of infrastructure. Other studies emphasize the absence of coordinated leadership among military, governmental, and humanitarian actors, which often results in inefficient resource allocation. Experiences from countries such as Somalia and Sudan show that weak governance exacerbates health inequities, particularly among internally displaced populations [76, 103]. Several studies underscore the urgent need for pre-established, flexible health governance frameworks that can maintain core functions during conflict and guide the transition to post-conflict recovery.

Regarding health service delivery, the dual burden of trauma care and the collapse of routine health services were found. Studies detail the pressure placed on triage systems and emergency response [82, 104], and others show sharp increases in vaccine-preventable diseases (such as measles and diphtheria) and infectious diseases (such as malaria and diarrheal illnesses) [105, 106]. As demonstrated in studies from Syria and Afghanistan, the management of non-communicable diseases (NCDs), including diabetes, cardiovascular diseases, and cancer, becomes severely disrupted [4, 97]. In studies from South Sudan and Myanmar, the reliance on mobile clinics and the maintenance of the cold chain for vaccines underscore the need for innovative and resilient models of health service delivery [77, 94].

Regarding the mental health and psychosocial support domain, there was a high prevalence of PTSD, anxiety, depression, and psychological distress among civilians, military personnel, and combatants [107, 108]. A promising finding is the effectiveness of community-based psychosocial interventions and the emerging role of digital tools, such as online counseling and virtual reality therapy, as demonstrated in Israel (particularly for healthcare workers) [81]. However, substantial gaps remain in the scalability and long-term sustainability of these interventions, especially in resource-poor settings.

The health of vulnerable populations has been addressed in most studies, showing that women, children, the elderly, and individuals with disabilities bear a disproportionate burden of health inequities [87, 109]. Evidence from Yemen, Tigray, and the Democratic Republic of Congo indicates increases in maternal and neonatal mortality due to disruptions in reproductive health services [110–112]. High rates of child malnutrition and declining vaccination coverage are recurring themes, identified not only during wartime but also as persistent crises in post-conflict periods [6]. Moreover, specific groups—survivors of gender-based violence—face unique and often overlooked health challenges requiring targeted interventions [113].

The pivotal role of technology in sustaining health services emerged as a key insight within health information systems and digital innovation. Studies from Israel highlight the successful use of telemedicine to maintain access to care, including mental health services [38, 81]. However, challenges related to data quality, cybersecurity, and digital infrastructure in crisis settings remain significant barriers [114]. The potential of artificial intelligence for disease surveillance and drones for logistics, though promising, requires further operational research in conflict contexts [115].

Regarding health economics and equity, war leads to catastrophic health expenditures and deepening inequalities [116]. Studies from Sierra Leone and Iraq document how households suffer severe financial hardship or bankruptcy due to healthcare costs [45, 99]. Access to healthcare is severely affected by poverty, displacement, and the destruction of health facilities, creating profound inequities [117]. The economic sustainability of health systems during war and post-conflict periods is also threatened [118].

The systemic crisis in health workforce training and capacity-building was found. Studies report high levels of burnout, migration, and targeted attacks against healthcare workers, resulting in severe shortages of personnel, particularly in rural and conflict-affected regions [91, 119]. There is a clear need for short-term, practical training for frontline workers, as well as strong psychological support mechanisms for the health workforce [120, 121].

Rebuilding health systems requires a long-term commitment to restoring destroyed infrastructure and recovering human resource capacities [122]. Studies stress the importance of international cooperation in providing financial resources and technical assistance [123, 124]. However, recovery efforts are often disrupted by ongoing insecurity and political instability, as seen in Syria [97]. Ultimately, strengthening health systems prior to conflict serves as the foundation for post-conflict resilience [119].

Within legal, ethical, and international cooperation frameworks, widespread violations of international humanitarian law were detected, characterized by repeated attacks on healthcare facilities and personnel, and the lack of accountability for such attacks remains a major challenge [125, 126]. Furthermore, ineffective coordination among humanitarian organizations often leads to duplication of services or inadequate coverage of populations in need. Ethical dilemmas—such as triage decisions during resource scarcity or providing care to individuals with substance use disorders—are insufficiently addressed by existing guidelines [80, 125]. Field evidence from Myanmar specifically demonstrates that displaced children under five years of age have been deprived of essential vaccinations. This deprivation is not only a humanitarian crisis but also a direct violation of the Geneva Conventions, which mandate the provision of essential healthcare for civilians—particularly children—during armed conflict [77]. In such cases, ineffective and delayed cooperation among international organizations has played a major role in perpetuating the crisis.

There were significant knowledge gaps and urgent research needs in health management during war and post-conflict crises. This finding can be directly used as a roadmap for future research. Managing health in war and post-conflict settings requires a fundamental transformation in policy and operational approaches. Health systems in these environments face multidimensional, interlinked challenges that can only be addressed through integrated, proactive strategies. Designing health resilience frameworks, developing unified surveillance systems, strengthening the health workforce, and expanding digital health services are key research priorities in this field.

At the operational level, strengthening primary healthcare, implementing targeted interventions for vulnerable groups, and establishing rapid crisis response systems are essential. At the macro level, developing standardized health governance protocols for crisis settings, ensuring adherence to international obligations, and creating innovative financing models form the essential foundations for rebuilding health systems. Together, these measures can enhance health system resilience and ensure equitable access to healthcare services even under the most challenging conditions.

Conclusion

Effective health management in war and post-conflict settings demands integrated, adaptive approaches that address immediate and long-term needs while prioritizing research to fill critical knowledge gaps and guide transformative policies and strategies.

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