Challenges and Strategies for Strengthening Emergency Care Systems in Post-Conflict Settings: A Comprehensive Review

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Abstract

Emergency care services (ECS) are vital for reducing mortality and morbidity in post-conflict regions, where fragile healthcare infrastructures and limited resources exacerbate health challenges. This review synthesizes current literature on ECS in post-conflict settings, employing the World Health Organization's Emergency Care System Framework to identify systemic deficiencies and context-specific needs. The findings highlight pervasive barriers, including inadequate infrastructure, insufficient medical supplies, limited formal emergency medical education, and societal mistrust. Restricted access to care, damaged transportation and communication networks, and disrupted referral systems further hinder ECS effectiveness. In many cases, triage systems are deficient, leading to resource misallocation and suboptimal patient outcomes. Despite these challenges, targeted interventions such as community education, standardized triage implementation, and capacity-building initiatives have shown promise.

However, a lack of quantitative evaluations limits the ability to assess their efficacy comprehensively. Addressing these gaps requires integrating robust training programs, enhancing resource allocation, and fostering community trust to build resilient ECS. The review underscores the need for standardized frameworks and increased donor engagement to optimize emergency care delivery and contribute to broader post-conflict recovery efforts.

Keywords: Emergency care systems, Post-conflict healthcare, Prehospital care, Healthcare infrastructure, Trauma systems.

Significance | This review identifies critical gaps and strategies to improve emergency care systems in post-conflict settings, enhancing healthcare delivery and outcomes.

1. Introduction

Emergency circumstances encompass a diverse range of acute ailments, injuries, infectious and non-infectious diseases, and pregnancy-related complications. These conditions significantly contribute to the global burden of disease and are leading causes of disability and premature mortality worldwide (Razzak et al., 2019). Emergency care services (ECS) play a critical role in delivering life-saving interventions by providing essential healthcare during patient transport and hospital-based care. A well-structured ECS system is vital for ensuring timely medical attention, stabilizing critically ill patients, and reducing mortality rates.

The World Health Organization (WHO) Emergency Care System Framework categorizes ECS into three primary components: on-site emergency response, transportation to an emergency unit (EU),

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and early hospital-based care. (Figure 1). Establishing these core functions enables healthcare systems to assess ECS capacity and determine the necessary personnel, equipment, and technology for optimal service delivery. In regions where ECS is functional, it often serves as the first point of contact within the healthcare system, facilitating prompt diagnosis and stabilization of severely ill patients. However, access to structured ECS remains uneven, particularly in low-resource settings. In Africa, only 49% of countries have established formal emergency care systems, highlighting a significant gap in healthcare access (Bhaumik et al., 2022).

The efficacy of prehospital emergency care has been demonstrated in multiple studies, with research suggesting that trauma-related mortality can be reduced by 25% in regions equipped with prehospital trauma services (Henry & Reingold, 2012). For example, cost-effective trauma systems implemented in Northern Iraq and Cambodia led to a decline in trauma mortality rates from 23.9% to 8.8% (Razzak et al., 2022). A key factor in this improvement was the reduction in time from injury to initial medical assistance, which decreased from 2.4 hours to 0.6 hours (Alruwaili et al., 2023). Given these outcomes, there is growing recognition of the need to enhance global emergency care through locally relevant and resource-sensitive approaches (Reynolds et al., 2017; Lecky et al., 2020; Carlson et al., 2019).

Despite these advancements, delivering emergency care in fragile and conflict-affected settings remains a formidable challenge. Approximately one-fourth of the global population resides in such environments, where healthcare infrastructure is often inadequate, and systematic data to guide policy decisions is limited (United Nations, 2022). In post-conflict settings, disruptions in transportation, communication, and referral networks severely impact emergency medical response (Chi et al., 2015; WHO, 2019). Poor road conditions hinder ambulance services, while damaged hospital infrastructure compromises the availability and coordination of urgent medical care. Additionally, the deterioration of communication networks impairs ECS activation, dispatch capabilities, and collaboration among emergency personnel (Acerra et al., 2009). In some cases, hospitals are overwhelmed with emergency cases despite lacking the requisite facilities to handle critical conditions. These systemic deficiencies contribute to preventable morbidity and mortality, particularly among vulnerable populations.

Addressing these challenges requires a comprehensive understanding of the interplay between post-conflict conditions and emergency medical services. This study aims to synthesize existing literature on ECS in post-conflict settings by utilizing the WHO Emergency Care System Framework to identify deficiencies in service delivery and highlight context-specific healthcare needs. The findings will provide policymakers with evidence-based

insights for optimizing ECS design and improving health sector planning in conflict-affected regions.

2. Methodology

A comprehensive literature review was conducted to identify relevant studies focusing on Emergency Care Services (ECS) in post-conflict contexts. The search was performed across five major databases—PubMed MEDLINE, Web of Science, Embase, Scopus, and the Cochrane Library—in 2023. The search strategy employed a combination of keywords and medical subject headings (MeSH) such as "emergency care services," "post-conflict health systems," "prehospital care," "trauma systems," and "healthcare infrastructure in conflict zones." Boolean operators were used to refine and expand the search criteria, ensuring that a wide array of literature was considered.

Studies were included if they specifically addressed the organization, delivery, or challenges of ECS in post-conflict settings. Both qualitative and quantitative studies were considered, including case studies, systematic reviews, and policy analyses. Studies focusing solely on combat medicine or military healthcare during active conflict were excluded to maintain a focus on post-conflict scenarios. Additionally, articles that dealt exclusively with disaster response unrelated to armed conflict were also omitted.

The initial search yielded a large body of literature, which was then screened based on titles and abstracts to filter out irrelevant studies. Full-text articles were subsequently reviewed for eligibility. To mitigate the risk of missing pertinent studies, the reference lists of all included articles were manually searched for additional relevant publications. This process ensured a comprehensive capture of both primary and secondary sources relevant to ECS in post-conflict environments.

Data extraction focused on identifying recurring themes related to healthcare infrastructure, resource availability, training and education, societal factors, and emergency care outcomes in post-conflict settings. The extracted data were synthesized thematically to highlight gaps in the literature, common challenges, and potential strategies for improving ECS in fragile health systems.

3. The Context of Emergency Medical Provision in Post-Conflict Scenarios

The field of emergency care systems (ECS) in post-conflict environments is still in its developmental stages, with much of the available literature adopting a descriptive approach. This indicates that emergency medical care, particularly in post-conflict settings, is a relatively new specialty (Razzak et al., 2019). Understanding the unique demands and operational challenges in these environments is crucial for establishing effective emergency medical systems. The findings from this comprehensive literature review underscore the

need to build foundational knowledge in this domain to optimize emergency care in regions recovering from conflict.

One of the most frequently cited issues in post-conflict scenarios is restricted access to healthcare services. In Colombia, for instance, a survey revealed that 20% of ex-combatants reported needing emergency medical treatment due to illness, yet only 16.4% actually sought care (Fernández-Niño et al., 2020). This discrepancy highlights the barriers to accessing emergency care, which may include logistical, financial, and social factors. Similar challenges were observed in Somaliland, where late presentations to emergency units (EUs) were common, suggesting that both physical access to medical facilities and awareness of the importance of timely medical intervention were inadequate (Sunyoto et al., 2014).

Triage systems, which are vital for managing limited medical resources and directing patients to the appropriate level of care, were found to be significantly deficient in many post-conflict settings (Bhaumik et al., 2022; Shustak et al., 2023). Without robust triage mechanisms, the risk of resource misallocation and suboptimal patient outcomes increases, further complicating emergency medical responses in these already strained environments.

4. Inadequate Infrastructure

The relationship between conflict and the development of ECS is complex and often intertwined. While conflict can hinder the establishment of emergency medical systems, post-conflict periods may also present opportunities for ECS development initiatives, especially in areas where such services were previously underdeveloped (Kruk et al., 2010). However, the destruction of critical infrastructure during conflicts poses significant challenges to emergency care provision.

In many cases, essential infrastructure such as roads, communication networks, and healthcare facilities are damaged or destroyed during conflicts, severely limiting the ability to provide timely and effective emergency care. For example, bombings and other forms of violence can make roads impassable, hindering the transportation of patients and the delivery of medical supplies (Alruwaili et al., 2023; Gashi et al., 2022). Moreover, inadequate communication systems can disrupt the coordination of emergency services, leading to delays and inefficiencies in medical response efforts.

The residual effects of war, such as damaged medical equipment and non-functional healthcare facilities, further complicate the delivery of emergency care in post-conflict settings. These challenges were evident in studies that highlighted the shortcomings of prehospital care across various post-conflict regions. For instance, the pathways to urgent care, whether for maternal emergency obstetric care (EmOC) or general trauma treatment, were often long and hazardous, exacerbating the risks to patient health and survival (McGarry et al., 2017).

5. Persistent Societal Mistrust

Restoring trust among communities and between healthcare providers and patients is a significant challenge in post-conflict settings. The lingering effects of societal divisions and historical animosities can severely impact healthcare delivery. During the Serbian occupation of Kosovo, for example, ethnic tensions led to rival groups avoiding medical care from institutions operated by their adversaries. Many Albanians preferred seeking treatment in private medical centers run by fellow Albanians rather than in Serbian-operated government facilities (Chi et al., 2015).

Such persistent societal mistrust complicates efforts to establish equitable healthcare systems in post-conflict environments. The fragmentation of healthcare services along ethnic or political lines can lead to unequal access to medical care, particularly for vulnerable populations. However, there are strategies to mitigate these issues. In Afghanistan, the use of community scorecards helped foster trust between citizens and healthcare providers, improving the overall confidence in the healthcare system (Acerra et al., 2009).

Increasingly, studies highlight the role of health systems in reinforcing social cohesion and reducing inequality in post-conflict settings. By promoting inclusive and equitable healthcare practices, emergency medical services can contribute to broader peacebuilding efforts and help mend the social fabric torn apart by conflict (Nelson et al., 2004).

6. Insufficiency of Formal Emergency Medical Education

A critical barrier to effective emergency medical care in post-conflict settings is the lack of formal education and training for healthcare providers. Many studies have noted that insufficient training in emergency medical protocols can lead to higher mortality and morbidity rates (Bhaumik et al., 2022; Nelson et al., 2004; Shustak et al., 2023). For example, research indicated that women requiring EmOC had better outcomes without a healthcare provider than with an incompetent one, underscoring the dangers of inadequate medical training (Sunyoto et al., 2014).

Efforts to improve emergency care education are underway in several post-conflict regions. In Liberia and Rwanda, for instance, emergency care education models involving foreign experts training local healthcare professionals have shown promising results (Epps et al., 2023; Shustak et al., 2023). These educational initiatives have had lasting impacts on wound care practices and blood/fluid management. However, more complex procedures, such as advanced airway management and trauma recovery techniques, have not seen as significant improvements, highlighting the need for ongoing training and support (Thompson et al., 2012).

The necessity for enhanced and specialized emergency care training at all levels—ranging from primary healthcare providers to emergency medicine specialists—is evident. First-aid training programs for primary healthcare workers have been effective in improving emergency care skills, but refresher courses are recommended to maintain proficiency. Programs such as Advanced Life Support in Obstetrics (ALSO) and Basic Life Support in Obstetrics (BLSO) along the Thailand-Myanmar border have demonstrated positive outcomes, including reduced rates of postpartum hemorrhage and maternal mortality (McGready et al., 2021).

The absence of formal training also adversely affects prehospital care. While many studies did not explicitly address the availability of protocols, evidence suggests that implementing proper medical guidelines can improve care processes and reduce mortality, even when care is provided by informally trained personnel (Wen & Char, 2011).

The provision of emergency medical care in post-conflict scenarios faces numerous challenges, including restricted access to healthcare, inadequate infrastructure, persistent societal mistrust, and insufficient formal medical education. Addressing these issues requires a multifaceted approach that combines infrastructure rebuilding, community engagement, and comprehensive education and training for healthcare providers. By understanding and tackling these barriers, it is possible to develop resilient emergency care systems that not only improve health outcomes but also contribute to the broader process of post-conflict recovery and peacebuilding.

7. Insufficient Resources and Supplies in Post-Conflict Emergency Care Systems

Resource limitations are a significant barrier to the effective delivery of emergency care services (ECS) in post-conflict settings. These constraints manifest across various dimensions, including inadequate medical supplies, insufficient medications, and a lack of essential equipment. In Afghanistan, for instance, emergency facilities were often found understocked, severely impairing their capacity to manage critical health needs (Acerra et al., 2009). The scarcity of appropriate drugs and medical supplies is a recurring challenge across multiple post-conflict environments, emphasizing the need for improved resource allocation and logistical frameworks to bolster ECS.

Several studies underscore the critical role of enhancing medical infrastructure and equipment in strengthening emergency care in post-conflict regions. Strengthening ECS requires not just improving physical infrastructure but also ensuring a consistent supply of medications and life-saving equipment (Reynolds et al., 2017). However, the allocation of resources for ECS often lags behind that of other health priorities, such as programs targeting HIV/AIDS, tuberculosis, and malaria. This discrepancy may result from donor preferences and long-standing investments in vertical disease programs, leaving emergency care underfunded and inadequately supported (Orkin et al., 2021).

The disparity in funding highlights broader systemic issues within global health financing, particularly in low-resource settings where external donor aid can constitute over 25% of total health expenditures (World Health Organization). These dynamics create a fragmented health financing landscape where emergency care, despite its critical role in addressing acute health crises, remains marginalized. This underfunding poses a significant challenge in post-conflict regions, where health systems are often fragile, and populations are vulnerable due to the compounded effects of conflict, displacement, and economic instability (Kruk et al., 2010). The limited global financing for ECS necessitates increased advocacy efforts to highlight the indispensable role of emergency care in achieving universal health coverage. Greater donor engagement is essential to bridge funding gaps and ensure that ECS receives the necessary support to operate effectively, particularly in fragile, post-conflict health systems (Carlson et al., 2019). This is crucial in contexts where ongoing insecurity exacerbates existing resource constraints, further complicating the delivery of emergency care services.

Nine studies included in this review were conducted in countries experiencing prolonged conflicts. Although these studies did not quantify the precise impact of persistent insecurity on ECS accessibility, it is plausible that post-conflict settings with continued instability face more pronounced challenges (Chi et al., 2015). In such environments, the interplay between insecurity and resource limitations creates a complex landscape for emergency care delivery, necessitating comprehensive strategies that address both logistical and security-related barriers.

8. Constraints in Defining and Evaluating Emergency Care in Post-Conflict Settings

A significant challenge in evaluating ECS in post-conflict environments is the absence of a standardized definition of "post-conflict" and clear criteria to delineate when a region transitions from active conflict to a post-conflict phase. This lack of clarity can result in inconsistencies in research inclusion, as studies from regions that might qualify under alternative definitions could be excluded (Werner et al., 2023). Similarly, defining the scope of ECS interventions presents difficulties, particularly in settings without well-structured emergency care systems.

For example, studies focusing on disaster medicine or crisis management components were excluded from this review, even though they may share overlapping principles with emergency medical care in post-conflict settings. Despite incorporating broad search terms such as "psychological trauma," "severe treatment,"
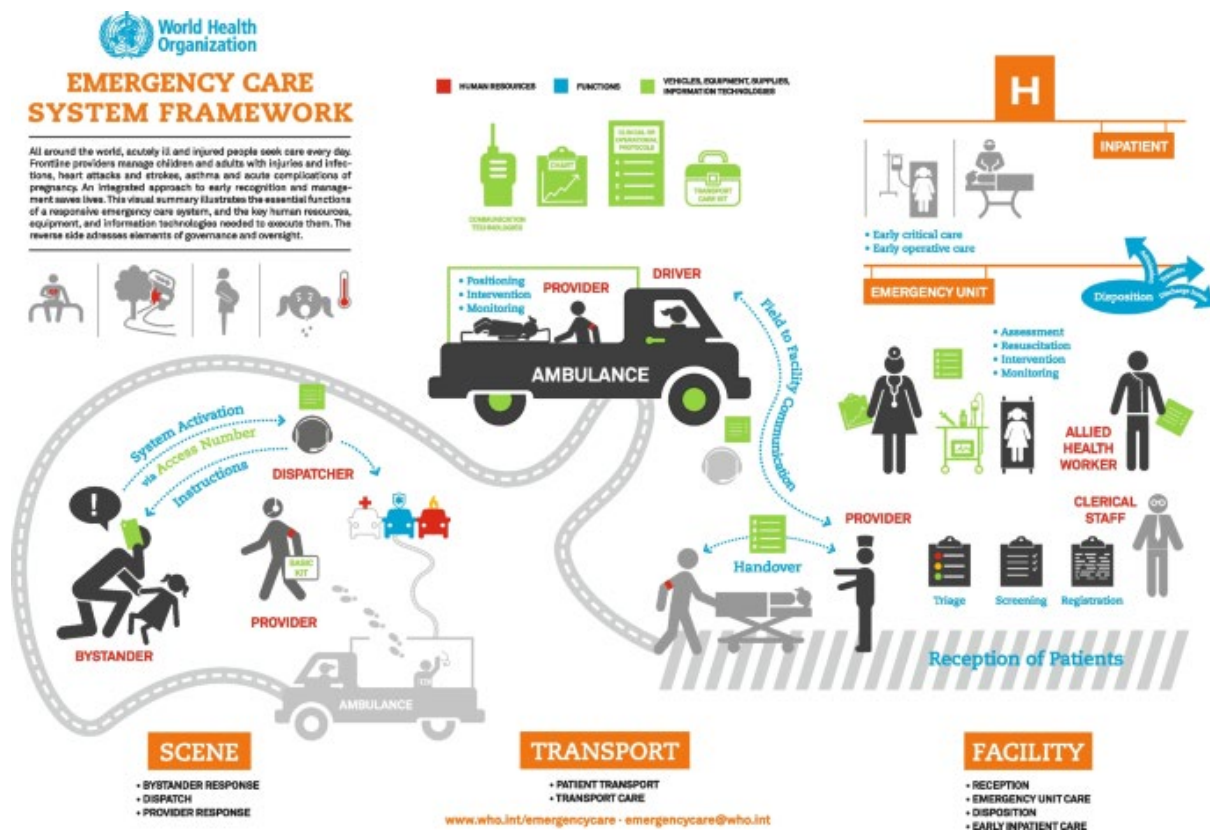
Figure 1. WHO Emergency Care Systems (ECS) Framework. (Image courtesy of WHO)

and "injury," some relevant studies may have been missed due to the inherent limitations of language in precisely defining "emergency care" (Liberati et al., 2009). To mitigate this, supplementary manual searches were conducted to identify additional relevant references. Another limitation arises from the diverse temporal and geographical contexts of the data. Studies ranged from those conducted during World War II in Europe to more recent conflicts in Sub-Saharan Africa, posing challenges in comparability due to differences in historical, socio-political, and health system contexts (Charlson et al., 2019). Furthermore, this review systematically excluded studies focused solely on combat medicine. While this approach was intended to prioritize sustainable healthcare solutions in post-conflict environments, it may have inadvertently omitted relevant insights, particularly in regions where the distinction between conflict and post-conflict settings is blurred.

These methodological constraints highlight the need for more precise definitions and standardized frameworks to guide research on ECS in post-conflict environments. Establishing clear criteria for post-conflict settings and emergency care interventions would improve the comparability and generalizability of research findings, ultimately contributing to more effective policy and practice in these fragile contexts (Hong et al., 2018).

9. Insights on Implementing Emergency Care in Post-Conflict Environments

While the literature on ECS in post-conflict settings is extensive, only a limited number of studies have systematically evaluated the effectiveness of specific interventions aimed at overcoming barriers to emergency care. Among the studies reviewed, several provided valuable insights into strategies that could enhance ECS delivery, though the diversity of post-conflict contexts necessitates cautious interpretation and generalization of these findings.

One study in Afghanistan highlighted the potential of non-military ambulance services in urban areas as a foundational step toward establishing comprehensive ECS. Additionally, community education initiatives aimed at raising awareness about essential health services were effective in reducing inappropriate demands for emergency resources, such as ambulances and specialist consultations (Acerra et al., 2009). This underscores the importance of community engagement and public health education in optimizing ECS utilization in post-conflict settings.

The introduction of standardized triage systems also demonstrated promising results. For example, the South African Triage Scale (SATS) was successfully implemented in district hospitals in Somaliland, suggesting its applicability in other post-conflict environments (Sunyoto et al., 2014). Triage systems are crucial in resource-limited settings, where efficient patient prioritization can significantly impact health outcomes.

Training and capacity-building initiatives emerged as critical components in strengthening ECS. While various programs, including foreign-led emergency medical education and healthcare training, were implemented, educational seminars were identified as having the most lasting impact on healthcare professionals' skills and attitudes (Fernández-Niño et al., 2020). This aligns with broader evidence indicating the importance of continuous professional development in sustaining healthcare quality in resource-constrained settings.

Moreover, several aspects of ECS, such as scene management and first-response care, are well-suited for integration into community-based healthcare initiatives. However, this review identified limited data on the effectiveness of community-oriented emergency care training programs, particularly in areas such as maternal and neonatal health, bystander intervention, and volunteer ambulance services in post-conflict environments (Boeck et al., 2018). These findings are consistent with existing literature emphasizing the potential of first aid training and task-shifting to non-professionals in reducing mortality and morbidity in low-resource settings (Molyneux et al., 2006).

Despite these promising insights, there is a notable paucity of quantitative evaluations assessing the effectiveness of ECS interventions in post-conflict environments. Most studies relied on narrative methodologies, limiting the ability to draw definitive conclusions about the efficacy of specific strategies. Future research should focus on rigorous quantitative assessments to validate the effectiveness of interventions, such as the establishment of triage systems, training healthcare personnel in essential emergency care skills, and implementing community-based first responder programs (Tenner et al., 2019).

While there is a growing body of knowledge on ECS in post-conflict settings, significant gaps remain, particularly in terms of resource allocation, methodological standardization, and quantitative evaluation of interventions. Addressing these gaps will require concerted efforts from policymakers, donors, and researchers to ensure that emergency care systems are adequately funded, effectively implemented, and sustainably maintained in some of the world's most vulnerable regions.

10. Conclusion

In conclusion, the delivery of Emergency Care Services (ECS) in post-conflict settings is hindered by multiple, interrelated challenges, including inadequate infrastructure, resource limitations, societal mistrust, and insufficient medical education and training. These barriers significantly impact access to timely, quality emergency care, contributing to preventable morbidity and mortality among vulnerable populations. Rebuilding healthcare infrastructure, fostering community trust, and implementing comprehensive training programs for healthcare providers are

essential for enhancing ECS effectiveness. Moreover, integrating standardized triage systems and community-based interventions can improve patient outcomes, particularly in resource-constrained environments. Despite advancements, funding discrepancies and the lack of standardized research methodologies remain critical barriers to optimizing ECS in post-conflict regions. Addressing these gaps requires a coordinated, multi-sectoral approach involving policymakers, donors, and healthcare professionals to ensure sustainable, equitable emergency care systems. Ultimately, strengthening ECS can play a pivotal role in not only improving health outcomes but also contributing to broader post-conflict recovery and peacebuilding efforts.

Author contributions
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Competing financial interests
The authors have no conflict of interest.

References

Acerra, J. R., Iskyan, K., Qureshi, Z. A., & Sharma, R. K. (2009). Rebuilding the healthcare system in Afghanistan: An overview of primary care and emergency services. International Journal of Emergency Medicine, 2, 77-82.https://doi.org/10.1007/s12245-009-0106-y

Adini, B., Cohen, R., Laor, D., & Israeli, A. (2011). Can patient flow be effectively controlled? Health Policy and Planning, 26, 518-525.https://doi.org/10.1093/heapol/czr002

Alobo, G., Ochola, E., Bayo, P., Muhereza, A., Nahurira, V., & Byamugisha, J. (2021). Why women die after reaching the hospital: A qualitative critical incident analysis of the 'third delay' in post-conflict North Uganda. Maternal and Child Health Journal, Md, 1-11.https://doi.org/10.1136/bmjopen-2020-042909

Alruwaili, A., Khorram-Manesh, A., Ratnayake, A., Robinson, Y., & Goniewicz, K. (2023). The use of prehospital intensive care units in emergencies-A scoping review. Healthcare, 11(21), 2892https://doi.org/10.3390/healthcare1121289

Bhaumik, S., Hannun, M., Dymond, C., DeSanto, K., Barrett, W., Wallis, L. A., & Mould-Millman, N. K. (2022). Prehospital triage tools across the world: A scoping review of the published literature. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine, 30(1), 32.https://doi.org/10.1186/s13049-022-01019-z

Boeck, M. A., Callese, T. E., Nelson, S. K., Schuetz, S. J., Fuentes, C., Mauricio, J., et al. (2018). The development and implementation of a layperson trauma first responder course in La Paz, Bolivia: A pilot study. Injury, 49, 885-896.https://doi.org/10.1016/j.injury.2017.11.022

Broccoli, M. C., Dixon, J., Skarpiak, B., Phiri, G., Muck, A. E., & Calvello, E. J. (2021). Application of the World Health Organization's basic emergency care course in Zambia. African Journal of Emergency Medicine, 11, 140-143.https://doi.org/10.1016/j.afjem.2020.09.011

Carlson, L. C., Reynolds, T. A., Wallis, L. A., & Calvello Hynes, E. J. (2019). Reconceptualizing the role of emergency care in the context of global healthcare delivery. Health Policy and Planning, 34, 78-82.https://doi.org/10.1093/heapol/czy111

Charlson, F., Van Ommeren, M., Flaxman, A., Cornett, J., Whiteford, H., & Saxena, S. (2019). New WHO prevalence estimates of mental disorders in conflict settings: A systematic review and meta-analysis. The Lancet, 394, 240-248.https://doi.org/10.1016/S0140-6736(19)30934-1

Chi, P. C., Bulage, P., Urdal, H., & Sundby, J. (2015). Barriers in the delivery of emergency obstetric and neonatal care in post-conflict Africa: Qualitative case studies of Burundi and Northern Uganda. PLoS One, 10, e0139120.https://doi.org/10.1371/journal.pone.0139120

Epps, L., Ramachandran, A., Yi, S., Mayah, A., Burkholder, T., Jaung, M., Haider, A., Wesseh, P., Shakpeh, J., Bills, C., & Enriquez, K. (2023). Implementation and outcomes of a comprehensive emergency care curriculum at a low-resource referral hospital in Liberia: A novel approach to application of the WHO Basic Emergency Care toolkit. PLoS One, 18(3), e0282690.https://doi.org/10.1371/journal.pone.0282690

Erickson, T. B., Vanrooyen, M. J., Werbiski, P., Mycyk, M., & Levy, P. (1996). Emergency medicine education intervention in Rwanda. Annals of Emergency Medicine, 28, 648-651.https://doi.org/10.1016/S0196-0644(96)70088-4

Fernández-Niño, J. A., Chavarro, L. M., Vásquez-Rodríguez, A. B., Rojas-Botero, M. L., Hernández-Neuta, G. E., & Peñuela-Poveda, A. M., et al. (2020). Perception of effective access to health services in territorial spaces for training and reincorporation, one year after the peace accords in Colombia: A cross-sectional study.https://doi.org/10.12688/f1000research.21375.2

Gashi, M., Bajraktari, G., Gashi, S. L., Ahmeti, H. R., & Degoricija, V. (2022). Correlates of in-hospital mortality in patients with acute coronary syndrome in Kosovo. Acta Clinica Croatica, 61(1), 19-28.https://doi.org/10.20471/acc.2022.61.01.03

Goosen, J., Bowley, D. M., Degiannis, E., & Plani, F. (2003). Trauma care systems in South Africa. South African Medical Journal, 34, 704-708.https://doi.org/10.1016/S0020-1383(03)00153-0

Henry, J., & Reingold, A. (2012). Prehospital trauma systems reduce mortality in developing countries: A systematic review and meta-analysis. Journal of Trauma and Acute Care Surgery, 73, 261-268.https://doi.org/10.1097/TA.0b013e31824bde1e

Hong, Q., Fabregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., et al. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. Education for Information, 34, 285-291.https://doi.org/10.3233/EFI-180221

Kennedy, K., Aghababian, R. V., Gans, L., & Lewis, C. P. (1996). Triage: Techniques and applications in decision making. Annals of Emergency Medicine, 28, 136-144.https://doi.org/10.1016/S0196-0644(96)70053-7

Khan, A., Mahadevan, S. V., Dreyfuss, A., Quinn, J., Woods, J., Somontha, K., et al. (2016). One-two-triage: Validation and reliability of a novel triage system for low-resource

settings. Emergency Medicine Journal, 33, 709-715.https://doi.org/10.1136/emermed-2015-205430

Kivlehan, S., Dixon, J., Kalanzi, J., Sawe, H., Chien, E., Robert, J., et al. (2019). Impact of the World Health Organization basic emergency care course in Tanzania and Uganda. PLoS One, 14, e0224257.https://doi.org/10.21203/rs.2.19074/v1

Kruk, M. E., Freedman, L. P., Anglin, G. A., & Waldman, R. J. (2010). Rebuilding health systems to improve health and promote state-building in post-conflict countries: A theoretical framework and research agenda. Social Science & Medicine, 70, 89-97.https://doi.org/10.1016/j.socscimed.2009.09.042

Kruk, M. E., Rockers, P. C., Williams, E. H., Varpilah, S. T., Macauley, R., & Galea, S. (2010). Availability of essential health services in post-conflict Liberia. Bulletin of the World Health Organization, 88, 527-534.https://doi.org/10.2471/BLT.09.071068

Lashoher, A., Schneider, E. B., Juillard, C., Stevens, K., Colantuoni, E., Berry, W. R., et al. (2017). Implementation of the World Health Organization trauma care checklist program in 11 centers across multiple economic strata: Effect on care process measures. World Journal of Surgery, 41, 954-962.https://doi.org/10.1007/s00268-016-3759-8

Lecky, F. E., Reynolds, T., Otesile, O., Hollis, S., Turner, J., Fuller, G., et al. (2020). Harnessing inter-disciplinary collaboration to improve emergency care in low- and middle-income countries (LMICs): Results of research prioritization setting exercise. BMC Emergency Medicine, 20, 68.https://doi.org/10.1186/s12873-020-00362-7

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., et al. (2009). The PRISMA Statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: Explanation and elaboration. PLoS Medicine, 6, e1000100.https://doi.org/10.1371/journal.pmed.1000100

McGready, R., Rijken, M. J., Turner, C., Than, H. H., Tun, N. W., Min, A. M., et al. (2021). A mixed methods evaluation of Advanced Life Support in Obstetrics (ALSO) and Basic Life Support in Obstetrics (BLSO) in a resource-limited setting on the Thailand-Myanmar border. Wellcome Open Research, 6, 94.https://doi.org/10.12688/wellcomeopenres.16599.1

Molyneux, E., Ahmad, S., & Robertson, A. (2006). Improved triage and emergency care for children reduces inpatient mortality in a resource-constrained setting. Bulletin of the World Health Organization, 84, 314-319.https://doi.org/10.2471/BLT.04.019505

Nelson, B. D., Fernandez, W. G., Galea, S., Sisco, S., Dierberg, K., Gorgieva, G. S., et al. (2004). War-related psychological sequelae among emergency department patients in the former Republic of Yugoslavia. BMC Medicine, 10, 1-10.https://doi.org/10.1186/1741-7015-2-22

O'Hanlon, K., & Lerner, E. (2007). Post-war development of emergency medicine in Kosovo. Emergency Medicine Journal, 24, 18-21.https://doi.org/10.1136/emj.2006.03599

O'Meara, M., Porter, K., & Greaves, I. (2007). Triage. Trauma, 9, 111-118.https://doi.org/10.1177/1460408607084180

Orkin, A. M., Venugopal, J., Curran, J. D., Fortune, M. K., McArthur, A., Mew, E., et al. (2021). Emergency care with lay responders in underserved populations: A systematic review. Bulletin of the World Health Organization, 99, 514-528.https://doi.org/10.2471/BLT.20.270249

Ramsden, S., & Cresswell, R. (2019). First aid and voluntarism in England, 1945-85. Twentieth Century British History, 30, 504-530.https://doi.org/10.1093/tcbh/hwy043

Razzak, J. A., Bhatti, J., Wright, K., Nyirenda, M., Tahir, M. R., & Hyder, A. A. (2022). Improvement in trauma care for road traffic injuries: An assessment of the effect on mortality in low-income and middle-income countries. The Lancet, 400(10348), 329-336.https://doi.org/10.1016/S0140-6736(22)00887-X

Razzak, J., Usmani, M. F., & Bhutta, Z. A. (2019). Global, regional and national burden of emergency medical diseases using specific emergency disease indicators: Analysis of the 2015 global burden of disease study. BMJ Global Health, 4, 733.https://doi.org/10.1136/bmjgh-2018-000733

Reynolds, T. A., Sawe, H., Rubiano, A. M., Shin, S. D., Wallis, L., & Mock, C. N. (2017). Strengthening health systems to provide emergency care. In D. T. Jamison, H. Gelband, S. Horton, P. Jha, R. Laxminarayan, C. N. Mock, & R. Nugent (Eds.), Disease Control Priorities: Improving Health and Reducing Poverty (3rd ed., Chapter 13). Washington, DC: The International Bank for Reconstruction and Development / The World Bank.https://doi.org/10.1596/978-1-4648-0527-1_ch13

Samuel, N., Hirschhorn, G., Chen, J., Steiner, I. P., & Shavit, I. (2013). Prehospital injury severity of children evacuated by helicopters from combat zones: A retrospective report. Journal of Emergency Medicine, 44, 641-645.https://doi.org/10.1016/j.jemermed.2012.07.082

Shustak, A., Uwitonze, J. M., Kabagema, J., Wojick, M., Asay, B., Louka, A., Wolfe, L., Dushime, T., & Jayaraman, S. (2023). Managing medical emergencies: Sustainable pre-hospital medical education in Rwanda. Rwanda Medical Journal, 80(3), 34-41.https://doi.org/10.4314/rmj.v80i3.5

Sunyoto, T., Bergh, R. D., Valles, P., Gutierrez, R., Ayada, L., Zachariah, R., et al. (2014). Providing emergency care and assessing a patient triage system in a referral hospital in Somaliland: A cross-sectional study. BMC Health Services Research, 14, 531.https://doi.org/10.1186/s12913-014-0531-3

Tenner, A. G., Sawe, H. R., Amato, S., Kalanzi, J., Kafwamfwa, M., Geduld, H., et al. (2019). Results from a World Health Organization pilot of the basic emergency care course in Sub-Saharan Africa. PLoS One, 14, e0224257.https://doi.org/10.1371/journal.pone.0224257

Thompson, M. E., Harutyunyan, T. L., & Dorian, A. H. (2012). First aid training course for primary health care providers in Nagorno Karabagh: Assessing knowledge retention. Prehospital and Disaster Medicine, 27, 509-514.https://doi.org/10.1017/S1049023X1200132

Vanier, V. K., Vanrooyen, M. J., Lis, J., & Eliades, M. J. (2001). Post-war Kosovo: Part I assessment of prehospital emergency services. Prehospital and Disaster Medicine, 16, 263.https://doi.org/10.1017/S1049023X00043405

Wen, L. S., & Char, D. M. (2011). Existing infrastructure for the delivery of emergency care in post-conflict Rwanda: An initial descriptive study. African Journal of Emergency Medicine, 1, 57-61https://doi.org/10.1016/j.afjem.2011.07.004

Werner, K., Kak, M., Herbst, C. H., & Lin, T. K. (2023). Emergency care in post-conflict settings: A systematic literature review. BMC Emergency Medicine, 23(1), 37.https://doi.org/10.1186/s12873-023-00775-0