

Access this article online

Quick Response Code:



Website:

https://journals.lww.com/jehp/

DOI:

10.4103/jehp.jehp_683_25

Developing a hospital response plan for mass casualties in traumatic incidents: A study protocol

Mehdi Tajik-Nodijeh, Golrokh Atighechian¹, Mehdi Nasr Isfahani², Nahid Tavakoli¹

Abstract:

BACKGROUND: Mass Casualty Incidents (MCIs) are events in which a significant number of individuals sustain injuries, overwhelming the capacity and capabilities of local medical facilities and healthcare centers. Preparedness, along with a well-defined operational and execution plan for managing mass casualties in hospitals, is critical during disasters and emergencies. The absence of such a plan leads to an ineffective response to the incident and a worsening of the conditions in the hospital. This research aims to develop a response plan for managing these incidents in the hospital. MCIs occur when large numbers of people are injured, overwhelming local medical facilities. Having a clear action plan, along with preparedness critical for hospitals to manage these situations during disasters. Without such a plan, responses become ineffective and hospital conditions deteriorate. This research aims to develop a response plan for hospitals to manage these incidents.

MATERIALS AND METHODS: This qualitative study will aim to develop a hospital response plan for mass casualties in traumatic incidents in Iran. Initially, a scoping review will be conducted to identify the components and elements of the response plan for mass casualties. Following this, semi-structured interviews will be held to obtain insights from experienced individuals, hospital managers, and experts in the health sector. In the next phase, a focus group discussion will be organized to develop the initial response plan for mass casualties in hospitals in Iran. Finally, the plan will be validated through a simulation and exercise based on a full-scale drill in a hospital. This study involves four phases: a scoping review to identify components, semi-structured interviews with experts, focused group discussions to develop the initial model, and validation through scenario-based drills.

CONCLUSION: This study first defines the concept of mass casualties resulting from traumatic incidents and then, by identifying its various dimensions, proposes a hospital response plan for such incidents. This response plan helps hospitals effectively handle such incidents, ensuring optimal and efficient care for casualties.

Keywords:

Disaster medicine, emergency preparedness, hospital emergency planning, mass casualty incidents, trauma centers

Introduction

Mass casualty incidents (MCIs) are those where, using available facilities and resources, routine medical operations cannot adequately respond to the situation.^[1] Mass casualties constitute a significant part of an incident, and hospitals play a vital role in responding to these situations, which involve a large

number of injured individuals. To perform this efficiently, each hospital needs to have its emergency response plan.^[2] Hospitals, often operating with limited resources, can quickly be overwhelmed by a surge of injuries, including trauma from bomb blasts, gunshot wounds, burns, motor vehicle accidents, and life-threatening complications.^[3] Five common challenges in mass casualty management include: identifying the situation and dealing with

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 License (CC BY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Tajik-Nodijeh M, Atighechian G, Nasr Isfahani M, Tavakoli N. Developing a hospital response plan for mass casualties in traumatic incidents: A study protocol. J Edu Health Promot 2026;15:309.

Emergency & Disaster
Health Department,
School of Management
and Medical Information
Sciences, Isfahan
University of Medical
Sciences, Isfahan, Iran,
¹Health Management and
Economics Research
Center, Isfahan University
of Medical Sciences,
Isfahan, Iran, ²Department
of Emergency Medicine,
School of Medicine,
Isfahan University of
Medical Sciences, Isfahan,
Iran

Address for correspondence:

Dr. Nahid Tavakoli,
Health Management and
Economics Research
Center, Isfahan University
of Medical Sciences,
Hezarjerib Street,
Isfahan, Iran.
E-mail: tavakoli@mng.
mui.ac.ir

Received: 11-04-2025

Accepted: 26-06-2025

Published: 31-07-2026

uncertainty during operations, mismatches between the contingency plan and reality, organizational functional crises, aligning medical responses with actual conditions, and ensuring a flexible response.^[4] In this context, the Florida Department of Health categorizes MCIs based on the expected number of injured, which includes: Level 1 with 5–10 casualties, Level 2 with 11–20 casualties, Level 3 with 21–100 casualties, Level 4 with 101–1,000 casualties, and Level 5 with over 1,000 casualties.^[5] When developing an optimization model for responding to MCIs, facing high and significant demand from injured patients and inadequate resources and personnel to provide patient care is inevitable. Our goal is to create a model that is practically applicable and addresses the prediction of resource and personnel shortages during a mass casualty incident, aiming to improve hospital performance, reduce congestion in hospitals, and focus on the well-being of patients while addressing shortages.^[6,7] Effective management of these incidents relied on early and independent mobilization, simultaneous efforts to safeguard other patients, increased capacity for imaging, surgery, and hospitalization, recruitment of external staff, and the secondary transfer of patients to other medical centers for definitive care.^[8]

Given the diverse causes of mass casualties, managing traumatic incidents poses significant challenges for hospital managers due to their unique conditions and characteristics. Imbalances and a lack of coordination between the hospital's emergency department, operating rooms, and other surgical departments can lead to long waiting times in emergency departments and high bed occupancy rates, resulting in congestion in emergency rooms and hospitals.^[9] Since the survival of traumatic casualties depends on prompt action and definitive treatment in hospitals, it is crucial to assess and manage these casualties effectively and to take appropriate actions for their treatment.^[10] During MCIs, trauma care must prioritize the immediate triage and treatment of patients with time-sensitive surgical needs to enhance survival rates and outcomes.^[11] Training staff through various exercises involving mass casualties is essential for building confidence and consistency across different hospital units. Utilizing human mannequins for effective training allows for a thorough review and repetition of time management in treating and admitting patients.^[12] Coordination between medical and paraclinical departments, including blood banks, laboratories, and radiology, is essential for assessing the status of traumatic patients and establishing an accurate identification and registration system.^[13] The World Health Organization (WHO) emphasizes in its Hospital Safety Index (HSI) that the foundation of hospital performance is effective preparedness and response plans to handle emergencies and unexpected incidents.^[14] There are many problems and deficiencies in

responding to mass casualties resulting from traumatic incidents in hospitals that need to be examined and evaluated so that we can have a more complete and comprehensive response to these incidents. This study will be conducted to develop a response plan for mass casualties resulting from traumatic incidents in hospitals. By analyzing existing problems and previous studies based on available capacity, a comprehensive plan will be provided for operation and coordination between different hospital departments to offer the best services to the victims.

Beyramijam *et al.* (2021)^[15] conducted a study titled "Disaster preparedness in emergency medical service agencies: A systematic review" This study identified significant issues in hospitals during mass casualty management, including poor management and communication, structural problems, a lack of facilities, inadequate organization of human resources, and budget shortages. Jacobson *et al.* (2021)^[12] conducted a study titled "Mass-casualty training exercise using high-fidelity computerized simulators and involving time and resource limitation." The results indicated that mass casualty training exercises conducted under limited time and resource constraints are an effective method for enhancing staff capabilities. Tariverdi *et al.* (2018)^[5] conducted a study titled "Strategies for improved hospital response to MCIs." The results showed that a sudden influx of mass casualties into the emergency department significantly impacts staff response and management of casualties. Simply increasing the number of beds, without considering patient triage and management, proves ineffective. Additionally, if nurses focus on treating walk-in patients and those with less severe injuries, it can greatly help prevent congestion in the emergency department. In the study by Aldossary *et al.* (2023)^[16] titled "An optimization-based decision support model to dynamically coordinate the pre-hospital response of emergency services' resources to multiple mass casualty incident." it was found that The importance of the pre-hospital triage system, the need for predefined plans in mass and complex incidents, and optimizing the management of casualties in the hospital are among the most important issues, neglecting which can lead to many disasters. In the study conducted by Igra *et al.* (2024)^[17] various critical factors affecting the length of stay in the emergency department during MCIs were explored. Igra identified key elements such as the efficiency of initial triage, patient allocation to care areas, interdepartmental coordination, and the complexity of injuries, along with their treatment stages. The study emphasizes the significance of these factors in optimizing emergency response, minimizing overcrowding, and improving patient outcomes, and indicates that disaster response leaders in urban areas

should consider modeling different MCI scenarios and casualty numbers to determine optimal triage strategies for their area, given hospital numbers and blood product availability.

Hospitals face many challenges in dealing with MCIs, which have caused significant concerns for hospitals across the country. Developing a mass casualty incident response plan for trauma incidents can provide a unified and cohesive framework for all hospitals. This plan will have a direct impact on the quality of medical services provided to patients, the rescue of injured individuals, and the reduction of mortality rates. The response plan will enable better decision-making and more effective and efficient performance by hospital managers and staff. To establish a comprehensive and integrated concept and framework, as well as to respond to mass casualties resulting from trauma incidents in the country's hospitals, it is essential to develop a dedicated and comprehensive response plan. This study is novel in its comprehensive approach to integrating global best practices with local contextual factors to develop a practical and scalable hospital response plan for mass casualties in Iran.

Materials and Methods

Study design and setting

This qualitative study will be conducted in four consecutive phases to design and develop a mass casualty response plan for trauma incidents in hospitals. The first phase involves conducting a scoping review to conceptualize mass trauma casualties in the hospital. The second phase will employ semi-structured interviews to identify and examine the essential components of the response plan. During the third phase, preliminary

response plan models will be developed through focused group discussions. The final phase will validate and refine the response plan through realistic scenario-based exercises and drills to ensure its practical applicability and effectiveness.

Our qualitative study follows four consecutive phases to design and develop a mass casualty response plan for hospital trauma incidents. Phase 1 begins with a scoping review to conceptualize mass trauma casualties. Phase 2 uses semi-structured interviews to identify and examine the plan's essential components. In Phase 3, we'll develop preliminary response models through focus group discussions. Finally, Phase 4 validates and refines the plan through realistic scenario-based drills, ensuring practical applicability and effectiveness. The theoretical framework of the study for developing a hospital response program to mass trauma incidents is shown in Figure 1.

Study participants and sampling

This study will be conducted to develop a comprehensive Hospital Mass Casualty Response Plan for traumatic incidents. The research will engage key stakeholders across multiple domains including hospital health system administrators, emergency organization representatives, university treatment department officials, emergency medicine specialists and physicians, head nurses and emergency nursing staff, hospital clinical supervisors, hospital crisis committee secretaries, disaster and emergency health faculty members, and technical experts in mass casualty management from the healthcare sector.

Purposeful sampling was used to select participants with at least 5 years of experience in mass casualty management. To prevent information contamination,

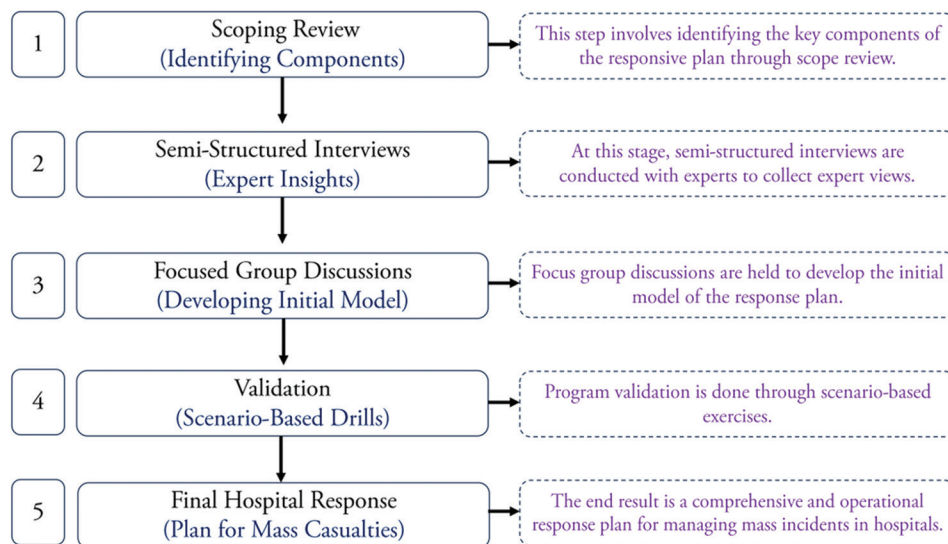


Figure 1: Theoretical framework of the study for developing a hospital response program to mass trauma incidents

interviews were conducted individually, and data were anonymized.

Data collection and analysis

The first phase: Scope review

In this phase, we aim to identify the components of a response plan for mass casualties resulting from traumatic incidents in hospitals across the world using a scope review method. A scope review is a method to answer questions within a specific domain. This review is used to determine the range and nature of research activities, distinguish the value of conducting a systematic review, summarize and publish study results, and identify research gaps in the existing literature on a specific topic.^[18] A scope review, like a systematic review, employs a structured process and systematic search method, but it does not have the limitations of systematic reviews, and a qualitative assessment of the articles under review is not mandatory.^[19-21]

In this phase, we aim to identify the components of mass casualty response plans for traumatic incidents in hospitals globally, using a scoping review method. A scoping review answers research questions within a specific field. We use it to determine the range and nature of research activities, clarify whether a systematic review would be valuable, summarize and publish existing findings, and spot gaps in current literature on this topic.^[18] Like systematic reviews, scoping reviews follow a structured process and systematic search method-but they avoid some limitations of systematic reviews, and critically appraising included articles isn't required.^[19-21]

We'll search databases like Web of Science, PubMed, Scopus, ProQuest, Cochrane, and SID for English and Persian articles published in the last decade. Using relevant keywords, standard search methods, and appropriate operators, we'll locate scientific resources. Applying inclusion/exclusion criteria, we'll identify articles about hospital mass casualty response plans. After selecting studies, we'll evaluate their methodology and choose credible sources. Beyond published articles, we'll also search gray literature like Theses, organizational documents, response plan reports, and valid guidelines. Websites of disaster management organizations (e.g., FEMA and WHO) will be reviewed too. At this stage, EndNote will manage resources while MAXQDA 2020 organizes and analyzes texts. Through document review, we'll identify global components of hospital trauma response plans to use in Phase 2 interviews. Source selection will prioritize relevance to hospital response programs for mass trauma casualties worldwide [Figure 2].

Search strategy

To achieve an effective search strategy, an initial search was conducted on Google Scholar and organizational

websites. The following groups of concepts were extracted from the articles:

(Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*)

Then, for each of the valid national and international databases, the primary search strategy was defined as shown in Table 1.

The second phase: Semi-structured interview

The second phase of the study is aimed at identifying the components and entities of the mass casualty response plan in hospitals within the country's health sector, utilizing semi-structured interviews. In-depth semi-structured interviews are considered a common source of qualitative data in qualitative research and the health sector, and they are one of the most prevalent methods of data collection.^[22,23]

The interview question guide in this study is derived from the results of the first phase. The study population at this phase includes managers of health systems in hospitals, emergency organizations, the treatment department of universities, emergency medicine specialists, emergency physicians, head nurses, emergency nurses, clinical supervisors in hospitals, secretaries of hospital crisis committees, disaster and emergency health professors, and technical experts and specialists in managing mass trauma casualties in hospitals and the health sector. At this phase, purposeful sampling will continue until saturation of opinions is reached. Participants' consent

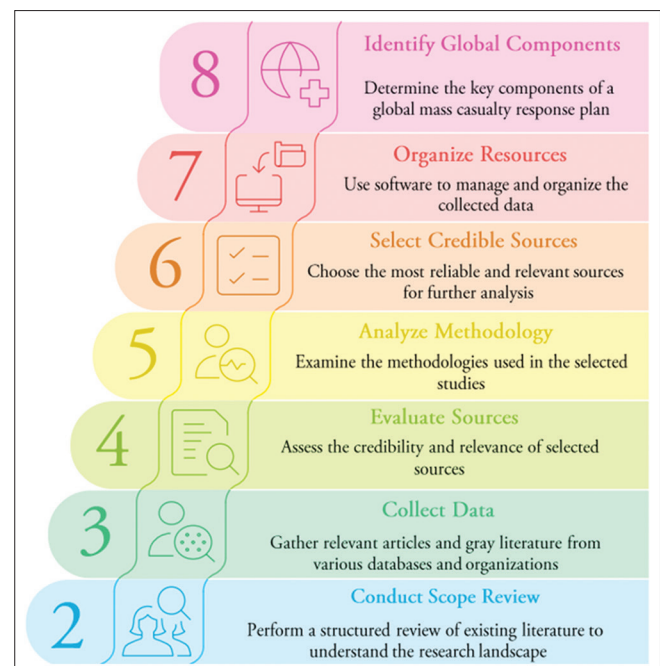


Figure 2: Phase 1: Developing a Mass Casualty Response Plan

Table 1: Search strategy

Database	Syntax	Results
PubMed	((Mass Casualt*[Title/Abstract]) AND (Hospital*[Title/Abstract])) AND (Trauma*[Title/Abstract] OR Injur*[Title/Abstract] OR Wound*[Title/Abstract]) OR ((("Mass Casualty Incidents"[Mesh]) AND ("Hospitals"[Mesh])) AND ("Wounds and Injuries"[Mesh] OR "injuries" [Subheading] OR "Trauma Centers"[Mesh]))	N: ?
Web of Science	(Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*) (Topic) in Web of Science Core Collection (A& HCl, BKCI-SSH, BKCI-S, CCR-EXPANDED, ESCI, IC, CPCI-SSH, CPCI-S, SCI-EXPANDED, SSCI)	N: ?
Scopus	(TITLE-ABS-KEY (trauma* OR injur* OR wound*) AND TITLE-ABS-KEY (hospital*) AND TITLE-ABS-KEY ((mass AND casualt*))) AND PUBYEAR>2010 AND PUBYEAR>2010	N: ?
Embase	'mass casualt*:ti, ab, kw AND hospital*:ti, ab, kw AND (trauma*:ti, ab, kw OR injur*:ti, ab, kw OR wound*:ti, ab, kw) AND [2011-2022]/py	N: ?
Cochrane	((Trauma* OR Injur* OR Wound*):ti, ab, kw AND (Hospital*):ti, ab, kw AND (Mass Casualt*):ti, ab, kw) OR (MeSH descriptor: [Wounds and Injuries] explode all trees AND MeSH descriptor: [Wounds and Injuries] explode all trees AND MeSH descriptor: [Trauma Centers] explode all trees)	N: ?
ProQuest	abstract((Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*)) OR subject((Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*)) OR title((Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*))	N: ?
Wiley	"(Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*)" in Abstract	N: ?
Ovid	((Mass Casualt* or mass catastroph* or mass disasters or mass fatalit*) and Hospital* and (Trauma* or Injur* or Wound*)):kw. or ((Mass Casualt* or mass catastroph* or mass disasters or mass fatalit*) and Hospital* and (Trauma* or Injur* or Wound*)):ab. or ((Mass Casualt* or mass catastroph* or mass disasters or mass fatalit*) and Hospital* and (Trauma* or Injur* or Wound*)):ti., limit 2 to yr="2011 -Current"	N: ?
CINAHL	TI ((Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*)) OR AB ((Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*)) OR MW ((Mass Casualt* OR mass catastroph* OR mass disasters OR mass fatalit*) AND Hospital* AND (Trauma* OR Injur* OR Wound*))	N: ?

*were included in the search strategy (Web of Science Core Collection) A&HCl: Arts & Humanities Citation Index; BKCI-SSH: Book Citation Index ;Social Sciences & Humanities; BKCI-S: Book Citation Index; Science; CCR-Expanded: Current Chemical Reactions; Expanded; ESCI: Emerging Sources Citation Index; IC: Index Chemicus; CPCI-SSH: Conference Proceedings Citation Index; Social Science & Humanities; CPCI-S: Conference Proceedings Citation Index; Science; SCI-Expanded: Science Citation Index Expanded; SSCI: Social Sciences Citation Index; CINAHL: Cumulative Index to Nursing and Allied Health Literature

will be obtained before the interviews begin. The research objectives and a summary will be explained to the interviewees by the researcher.

All interviews will be recorded and transcribed, and the transcriptions will be uploaded into MAXQDA 2020 for coding and data analysis. The qualitative content analysis method, one of the most common approaches in qualitative research, will be employed. This method includes three main stages: preparation, organization, and reporting.^[24] Participants in the study must have at least 5 years of recent experience in the field of mass trauma casualty management, as well as prior involvement in such incidents. Individuals who meet these criteria but withdraw from participation during the interview process or are unable to continue due to unforeseen circumstances will be excluded from the study.

First, the main categories will be identified, and the themes from the interviews will be coded accordingly. To ensure the accuracy of the data analysis, the coded material will be shown to some interviewees for corrective feedback [Figure 3].

The third phase: Focused group discussion

The development of the initial model for the mass casualty response plan resulting from traumatic incidents will take

place through a focused group discussion. The interaction among participants in this discussion will lead to the generation of opinions and data that may not have been identified in previous phases or individual questions. The group will consist of 6–10 individuals who are purposefully selected by the research team and are experts with experience in the field of study. The initial selection of individuals to participate in this phase of the study will be conducted purposively by the research team. Those who agree and provide consent will be included in the study.

The findings identified by the researchers will be shared with the participants, and the discussion questions will be addressed, allowing individuals to express their opinions. Initially, the questions will be simple, followed by more challenging ones, and the discussion will continue until saturation is reached. The session will be recorded for evaluation purposes, and additional meetings will be held if necessary. At the end, the data will be categorized, evaluated, and analyzed. Ultimately, the initial response plan for mass casualties resulting from traumatic incidents in hospitals will be developed [Figure 4].

The fourth phase: Drill

To validate the plan for responding to mass casualties from traumatic incidents in hospitals within the

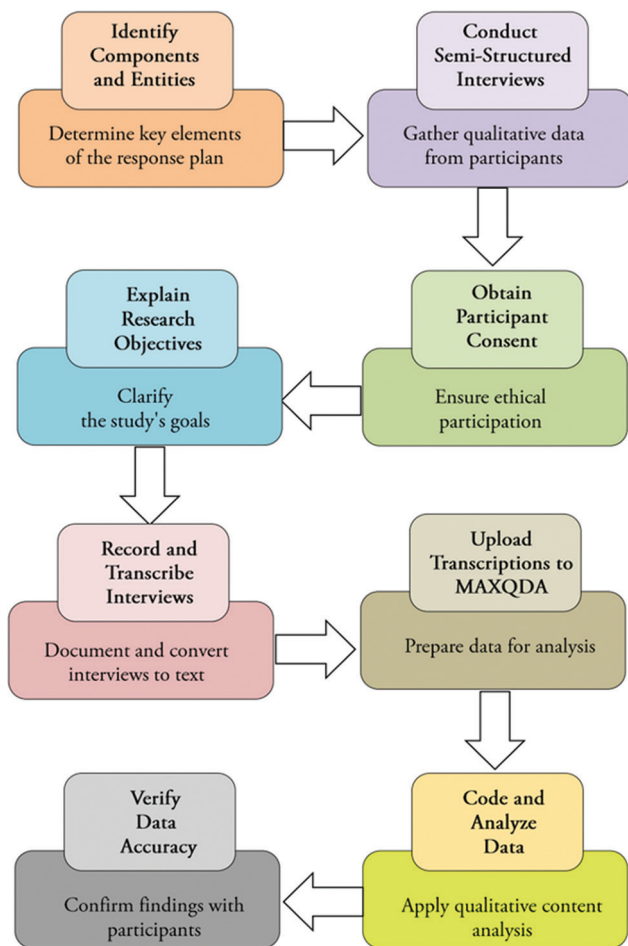


Figure 3: Phase2: Semi-Structured Interview

healthcare sector, developing and conducting drills and exercises based on real scenarios, as well as precise training and planning, are key components for preparedness. The exercise is a focused activity conducted in simulated conditions using available resources, similar to the actions individuals would take in real situations. One of the most important goals of the exercise is to strengthen and enhance readiness in order to test the policies, programs, and training provided to staff.^[25] Ultimately, these exercises create opportunities to increase the skills and knowledge necessary for responding to incidents.^[26]

To conduct the exercise, it is essential to develop and write understandable, realistic, and logical scenarios. In other words, a scenario is a text that describes a set of organized, meaningful, and related incidents and the specific outcome resulting from them. In the context of the healthcare system's preparedness for disasters and emergencies, a scenario refers to a text in which events are described that disrupt the normal operations of healthcare service providers due to an incident or that threaten the health and lives of the public, patients, and staff.



Figure 4: The third phase: focus group discussions (FGDs)

Designing the exercise involves creating a realistic scenario that encompasses all possible and probable events related to the organization following the occurrence of the specified incident. Thus, the response program developed will undergo evaluation and validation [Figure 5].

Discussion

The healthcare system in Iran faces significant challenges in managing mass casualties resulting from traumatic incidents. Hospitals, as the primary responders to such incidents, face multiple operational and logistical difficulties. To address these issues, this research aims to develop a straightforward, practical, and operational response plan tailored to hospitals across the country. By considering local conditions, resource capacities, and contextual factors, the proposed plan seeks to enhance preparedness and response efficiency. The outcomes of this research are expected to provide valuable insights and actionable recommendations for policymakers and decision-makers at the national, regional, and provincial levels. Additionally, the development of this operational plan will lead to the adoption of a unified and standardized protocol, ensuring timely and high-quality service delivery to the injured. As a protocol study, this research anticipates challenges in implementation, including resource constraints and staff training.

Limitations and recommendations

1. Scope of the Study
 - Limited Generalizability: The findings may not apply to all hospitals, especially those in different regions or with varying resources.
2. Data Collection Challenges

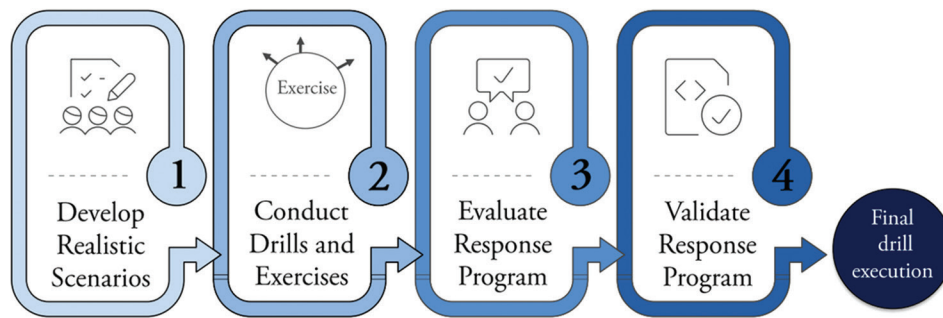


Figure 5: The fourth phase: Drill

- Access to Sensitive Information: Gaining access to data on past incidents may be difficult due to privacy concerns.
 - Reliability of Data: The quality of historical data on MCIs may vary, affecting the study's conclusions.
3. Stakeholder Engagement
- Variability in Participation: Different levels of engagement from hospital staff and management may affect the study's outcomes.
 - Resistance to Change: Existing protocols may be difficult to alter due to institutional inertia or resistance from staff.

Conclusion

This protocol study will develop a Hospital Response Plan for Mass Casualties in Traumatic Incidents. As a foundational research document, the protocol study article establishes the complete methodological framework before data collection, detailing study objectives, participant selection criteria, implementation processes, data collection procedures, and analytical methods to guide the rigorous execution of the research. The proposed response plan aligns with WHO's Hospital Safety Index and emphasizes interdepartmental coordination and resource optimization.

Acknowledgement

Acknowledgement of this manuscript is part of the Health in Emergencies and Disasters Ph. D. Thesis, referenced under the scientific code (3402142). We would like to thank Isfahan University of Medical Sciences for supporting this research.

Ethics and dissemination

Ethical approval for this study has been obtained from the Research Ethics Committee of Isfahan University of Medical Sciences (IR.ARI.MUI.REC.1402.051). This article is extracted from a PhD thesis, referenced under the scientific code (3402142). The results of the study will be communicated to stakeholders, published in reputable journals, and presented at conferences. Once this research is complete, its results can be shared with

hospitals, which can adjust their preparedness and response plans based on their situation.

Financial support and sponsorship

This research protocol was funded by the Isfahan University of Medical Sciences, Isfahan, Iran.

Conflicts of interest

There are no conflicts of interest.

References

1. Sadat SJ, Afrasiabifar A, Khorasani-Zavarehg D, Moradian MJ, Vafaenasab M, Dehghani Tafti A, et al. Exploring barriers and facilitators of inter-organizational management in response to mass casualty traffic incidents: A qualitative study. *Bull Emerg Trauma* 2021;9:86-95.
2. Ruffini C, Trentin M, Corona A, Caviglia M, Sechi GM, Migliari M, et al. Development and validation of a new tool to improve the accuracy of the hospital mass-casualty incident response plan activation: The PEMAAF score. *Prehosp Disaster Med* 2023;38:725-34.
3. Mani Z, Kuhn L, Plummer V. Emergency nurse roles, challenges, and preparedness in hospitals in the context of armed conflict. *Disaster Med Public Health Prep* 2024;18:e21.
4. Hugelius K, Becker J, Adolfsson A. Five challenges when managing mass casualty or disaster situations: A review study. *Int J Environ Res Public Health* 2020;17:3068.
5. TariVerdi M, Miller-Hooks E, Kirsch T. Strategies for improved hospital response to mass casualty incidents. *Disaster Med Public Health Prep* 2018;12:778-90.
6. Pouraliakbarimamaghani M, Mohammadi M, Mirzazadeh A. A multi-objective location-allocation model in mass casualty events response. *J Model Manage* 2018;13:236-74.
7. Castoldi L, Greco M, Carlucci M, Lennquist Montán K, Faccincani R. Mass Casualty Incident (MCI) training in a metropolitan university hospital: Short-term experience with MASS Casualty SIMulation system MACSIM®. *Eur J Trauma Emerg Surg* 2022;48:283-91.
8. Codish S, Frenkel A, Klein M, Geftler A, Dreier J, Schwarzfuchs D. October 7th 2023 attacks in Israel: Frontline experience of a single tertiary center. *Intensive Care Med* 2024;50:308-10.
9. Khajehaminian MR, Ardalani A, Hosseini Boroujeni SM, Nejati A, Keshkar A, Foroushani AR, et al. Criteria and models for the distribution of casualties in trauma-related mass casualty incidents: A systematic literature review protocol. *Syst Rev* 2017;6:141.
10. Campbell, JE. International Trauma Life Support for Emergency Care Providers: Julie Levin Alexander, USA, 2019. Available At: <https://www.mistralis.com/wp-content/uploads/2019/07/>

- International-Trauma-Life-Support-for-Emergency-Care-Providers-7th-Edition.pdf.
11. Levi H, Givaty G, Ovadia YS, Alon Y, Saban M. Evaluating emergency response at a hospital near the Gaza border within 24 h of increased conflict. *BMC Emerg Med* 2024;24:47.
 12. Jacobson PA, Severin PN, Rumoro DP, Shah S. Mass-casualty training exercise using high-fidelity computerized simulators and involving time and resource limitation. *Prehosp Disaster Med* 2021;36:313-20.
 13. Alazmy W, Williams B. Barriers and challenges to emergency medical services response to disasters and mass casualty incidents in the Middle East. *Int J Emerg Manag* 2021;17:105-21.
 14. Yari A, Hassanzadeh H, Akhbari K, Motlagh ME, Rahmani K, Zarezadeh Y. Hospital preparedness assessment for road traffic accidents with mass casualties: A cross-sectional study in Kurdistan Province, Iran. *BMC Emerg Med* 2024;24:68.
 15. Beyramijam M, Farrokhi M, Ebadi A, Masoumi G, Khankeh HR. Disaster preparedness in emergency medical service agencies: A systematic review. *J Educ Health Promot* 2021;10:258.
 16. Aldossary HE. An optimisation-based decision support model to dynamically coordinate the pre-hospital response of emergency services' resources to multiple mass casualty incidents. Doctor of Philosophy thesis, Newcastle University, the United Kingdom, 2023. Available At: <https://theses.ncl.ac.uk/jspui/bitstream/10443/6250/1/Aldossary%20H%20E%20S%202023.pdf>.
 17. Igra NM, Schmulevich D, Geng Z, Guzman J, Biddinger PD, Gates JD, et al.; THOR-AABB Workgroup. Optimizing mass casualty triage: Using discrete event simulation to minimize time to resuscitation. *J Am Coll Surg* 2024;238:41-53.
 18. Peters MD, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil H. Scoping reviews. *JBIM manual for evidence synthesis*. 2020. Page: 520-1.
 19. Munn Z, Peters MDJ, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol* 2018;18:143.
 20. Peters MD, Godfrey C, McInerney P, Khalil H, Larsen P, Marnie C, et al. Best practice guidance and reporting items for the development of scoping review protocols. *JBIM Evid Synth* 2022;20:953-68.
 21. Rezaeian M. An introduction to scoping review. *J Rafsanjan Univ Med Sci* 2018;17:291-2.
 22. Faria-Schützer DB, Surita FG, Alves VL, Bastos RA, Campos CJ, Turato ER. Seven steps for qualitative treatment in health research: The clinical-qualitative content analysis. *Cien Saude Colet* 2021;26:265-74.
 23. Buys T, Casteleijn D, Heyns T, Untiedt H. A reflexive lens on preparing and conducting semi-structured interviews with academic colleagues. *Qual Health Res* 2022;32:2030-9.
 24. Mayring P. *Qualitative content analysis: A step-by-step guide*. SAGE Publications Ltd, USA.; 2021. Available At: <https://uk.sagepub.com/en-gb/eur/qualitative-content-analysis/book269922>.
 25. Bajow N, Alesa S, Shaheen FA, Almalki A, Alshamrani A, Alotaibi R, et al. Assessment of the effectiveness of hospital external disaster functional drills on health care receivers' performance, using standardized patients and mass cards simulation: A pilot study from Saudi Arabia. *BMC Emerg Med* 2024;24:175.
 26. Holtschneider ME. Using standardized patients in large-scale hospital disaster drills. *J Nurses Prof Dev* 2017;33:90-1.