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Master's Degree in Disaster and Health Crisis Management

MASTER'S THESIS

Disaster Preparedness Training for Lay Populations:
Mapping Training Needs for Community-Level Emergency
Response

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Abstract

Background: Disaster preparedness has become a central component of international disaster risk reduction strategies, reflecting the growing recognition that effective emergency management depends not only on the capacity of professional responders but also on the preparedness of the general population. Although numerous educational initiatives have been developed in recent years, the competencies required by the lay population and the educational approaches adopted to strengthen preparedness remain fragmented across the available literature.

Aim: This scoping review aimed to map the principal training needs of the lay population in disaster preparedness and initial emergency response, examine the educational approaches currently described in the literature and identify existing knowledge gaps that may inform the development of future educational programmes.

Methods: The review was conducted according to the methodological framework proposed by Arksey and O'Malley and subsequent methodological refinements, following the PRISMA-ScR reporting guidelines. A systematic search of the PubMed/MEDLINE database identified studies published between 2015 and 2026. Following the application of predefined inclusion and exclusion criteria, 83 records were screened and 14 studies were included in the final review. Data were extracted using a structured charting table and analysed through qualitative thematic analysis.

Results: Four principal training need areas emerged from the analysis: Disaster Awareness and Risk Perception, Household and Community Preparedness, First Aid and Emergency Response Skills and Community Resilience and Citizen Engagement. Together, these themes describe disaster preparedness as a multidimensional process that combines theoretical knowledge, practical competencies, preparedness planning and active community participation. The review also showed an increasing use of learner-centred educational approaches, including simulation-based training, virtual reality, practical exercises and community-based participatory programmes, which were consistently associated with improvements in preparedness, risk awareness, practical skills and

community engagement. However, considerable heterogeneity in educational content, instructional methodologies and outcome measures remains, limiting direct comparisons across studies and highlighting the absence of shared educational frameworks.

Conclusions: The findings suggest that education of the lay population represents a fundamental component of disaster risk reduction and health emergency preparedness. Educational programmes designed around evidence-informed training needs and supported by active and contextualised teaching strategies may contribute to strengthening individual preparedness, enhancing community resilience and supporting more effective community-level emergency response. Further research is needed to develop standardised educational frameworks and evaluate the long-term effectiveness of disaster preparedness education across different settings and populations.

Keywords: disaster preparedness; lay population; disaster education; emergency preparedness; first aid; community resilience; disaster risk reduction; scoping review.

Introduction

Over recent decades, the frequency, magnitude and complexity of natural disasters, technological hazards and public health emergencies have increased substantially, representing one of the major challenges for global public health. Climate change, rapid urbanisation, population growth, globalisation and the increasing interconnectedness of social and economic systems have all contributed to greater population exposure to hazards and to a higher likelihood that extreme events will produce widespread health, social and economic consequences (United Nations Office for Disaster Risk Reduction, 2020).

According to the United Nations Office for Disaster Risk Reduction (UNDRR), more than 7,300 disaster events were recorded worldwide between 2000 and 2019, representing a marked increase compared with the previous two decades (United Nations Office for Disaster Risk Reduction, 2020). These events resulted in over 1.2 million deaths, affected more than four billion people and generated economic losses estimated at several trillion US dollars. Although earthquakes, floods, tropical cyclones and other natural hazards continue to account for a substantial proportion of recorded disasters, recent years have also highlighted the vulnerability of modern societies to large-scale public health emergencies. The COVID-19 pandemic, in particular, demonstrated the close interrelationship between health risks, health system resilience and community preparedness.

The World Health Organization (WHO) recognises disasters and health emergencies as major emerging threats to global health, emphasising that their consequences extend far beyond immediate mortality and traumatic injuries (World Health Organization, 2019). Disruptions to essential healthcare services, exacerbation of chronic diseases, mental health problems, food insecurity, forced displacement and the breakdown of social support systems are among the indirect consequences that may persist for months or even years following the acute event, further amplifying the overall health impact on affected populations.

The severity of these consequences depends not only on the characteristics of the hazard itself but also on the vulnerability and response capacity of the affected communities. Factors such as population density, socioeconomic conditions, the presence of vulnerable groups, infrastructure resilience and the organisation of healthcare systems substantially influence the ability to prevent, respond to and recover from disaster events (World Health Organization, 2019). From this perspective, disasters should not be viewed solely as the consequence of natural or technological hazards but rather as the result of the interaction between hazards, population exposure and existing vulnerabilities.

This evolving understanding has progressively transformed the international approach to disaster management. Whereas emergency management traditionally focused primarily on response activities, recent international strategies have increasingly emphasised prevention, preparedness and disaster risk reduction. This paradigm shift reflects the growing recognition that reducing the impact of disasters depends not only on the efficiency of emergency response systems but also on the ability of communities to prepare for adverse events, reduce their vulnerabilities and strengthen collective resilience (United Nations Office for Disaster Risk Reduction, 2015; World Health Organization, 2019).

Within this context, disaster preparedness has become one of the fundamental pillars of international disaster risk reduction strategies. The development of knowledge, competencies and capabilities across the population is increasingly recognised as essential for improving emergency response, reducing the health consequences of disasters and promoting faster and more sustainable community recovery. This perspective provides the foundation for understanding the increasingly important role of the lay population within contemporary disaster preparedness strategies, which is explored in the following section.

The growing awareness of the health, social and economic consequences of disasters has progressively shifted the focus of international disaster management from a predominantly response-oriented approach towards strategies centred on prevention, preparedness and disaster risk reduction. This transition is reflected in major international frameworks, particularly the *Sendai Framework for Disaster Risk Reduction 2015–2030*,

which recognises disaster risk reduction as a shared responsibility involving governments, institutions, healthcare systems and local communities (United Nations Office for Disaster Risk Reduction, 2015).

The Sendai Framework identifies strengthening disaster preparedness as one of the key priorities for reducing disaster risk, emphasising the importance of developing knowledge, skills and awareness among the population before disasters occur. Similarly, the *WHO Health Emergency and Disaster Risk Management (Health EDRM) Framework* highlights preparedness as an essential component of public health protection, promoting actions aimed at enhancing the capacity of individuals and communities to anticipate, respond to and recover from emergencies (World Health Organization, 2019).

Within this evolving paradigm, the role of the lay population has gained increasing attention. The term *lay population* refers to individuals without formal professional training in healthcare, emergency response, or civil protection who nevertheless live, work, or travel in areas potentially exposed to natural, technological, or biological hazards. Although these individuals are not considered emergency professionals, they are frequently among the first people directly affected by disasters and, consequently, among the first to react during the initial stages of an emergency.

International evidence suggests that the first minutes and hours following a disaster often represent a critical period during which organised emergency services may be delayed because of damaged infrastructure, communication failures, geographical barriers, or overwhelming demand. During this interval, members of the public are frequently required to make immediate decisions, protect themselves and others, activate emergency services, provide basic assistance and adapt to rapidly changing situations. Consequently, the actions undertaken by ordinary citizens during the early phases of a disaster may substantially influence both individual and community outcomes (United Nations Office for Disaster Risk Reduction, 2020).

For this reason, contemporary disaster preparedness strategies increasingly recognise communities not merely as recipients of emergency assistance but as active partners in disaster risk reduction. Rather than relying exclusively on the response capacity of

professional emergency services, current international frameworks advocate strengthening the preparedness of the general population by promoting risk awareness, self-protective behaviours, basic first aid competencies and the ability to respond appropriately during emergencies (United Nations Office for Disaster Risk Reduction, 2015; World Health Organization, 2019).

This perspective reflects a broader understanding of resilience, according to which community preparedness represents a fundamental determinant of disaster risk reduction. Communities that possess basic preparedness competencies are more likely to respond effectively during emergencies, reduce avoidable harm, support emergency responders and facilitate recovery processes. Consequently, strengthening the capabilities of the lay population is increasingly recognised as an integral component of comprehensive disaster preparedness strategies rather than as a complementary or optional activity.

Despite this growing recognition, important questions remain regarding which competencies should be prioritised, how disaster preparedness education should be delivered and which educational approaches are most effective for different population groups. Addressing these questions requires a comprehensive understanding of the training needs emerging from the current scientific literature, thereby providing the rationale for the present scoping review.

Although disaster preparedness education has become an increasingly important component of international disaster risk reduction strategies, the available evidence remains highly heterogeneous. Educational programmes targeting the lay population differ considerably in terms of their objectives, target populations, educational content, teaching methodologies and outcome measures, making direct comparisons across studies particularly challenging.

Some interventions focus primarily on first aid or cardiopulmonary resuscitation, whereas others address disaster awareness, household preparedness, community resilience, or behavioural responses during emergencies. Likewise, educational approaches range from traditional lectures and public information campaigns to simulation-based activities,

virtual reality, practical exercises and community-based participatory programmes. Although these initiatives reflect the growing recognition of the importance of community preparedness, they also highlight the absence of a shared framework defining the competencies that should be prioritised and the educational strategies best suited to different population groups.

This heterogeneity is further reflected in the methods used to evaluate educational effectiveness. Existing studies assess a wide range of outcomes, including knowledge acquisition, disaster awareness, perceived preparedness, self-efficacy, practical skills, behavioural intentions and community engagement, often using study-specific instruments that have not undergone formal validation. Consequently, synthesising the available evidence and identifying the educational strategies most likely to improve disaster preparedness among the lay population remain challenging.

Recent evidence suggests that disaster preparedness education is progressively evolving from isolated first aid initiatives towards more comprehensive educational programmes integrating risk awareness, preparedness planning, practical emergency response skills and active community participation (Guo et al., 2025). However, despite this evolution, the current evidence remains fragmented and lacks a comprehensive synthesis of the principal training needs emerging across different disaster contexts and target populations.

International organisations, including the World Health Organization and the United Nations Office for Disaster Risk Reduction, consistently advocate strengthening community preparedness through education, capacity building and public engagement (United Nations Office for Disaster Risk Reduction, 2015; World Health Organization, 2019). Nevertheless, these recommendations provide limited guidance regarding the specific competencies that should be prioritised when designing educational programmes for the lay population. As a result, educational interventions are frequently developed without a comprehensive evidence-based understanding of the actual training needs emerging from the scientific literature.

From this perspective, systematically mapping the training needs described in the available evidence represents an essential preliminary step for the development of future disaster preparedness education programmes. Identifying the competencies most consistently reported across different settings may contribute to designing more evidence-informed educational interventions, improving their relevance to community needs and supporting preparedness strategies capable of strengthening individual preparedness, community resilience and public health emergency response.

The growing recognition of the importance of community preparedness, together with the considerable heterogeneity of the available educational interventions, highlights the need for a comprehensive synthesis of the current evidence regarding disaster preparedness education for the lay population. Although international organisations consistently advocate strengthening public preparedness through education and capacity building, the existing literature provides limited guidance on which competencies should be prioritised, how educational programmes should be designed and which instructional approaches are most appropriate for different contexts and population groups.

In this scenario, a scoping review represents the most appropriate methodological approach to comprehensively map the available evidence, identify the principal training needs described in the literature, examine the educational approaches currently adopted and highlight existing knowledge gaps requiring further investigation. Unlike systematic reviews, which are primarily designed to evaluate the effectiveness of specific interventions, scoping reviews are particularly suitable for addressing broad research questions, exploring heterogeneous bodies of literature and providing an overall conceptual understanding of complex and emerging fields of research (Peters et al., 2020).

Accordingly, the present review was undertaken to provide a structured overview of the competencies considered essential for disaster preparedness and initial emergency response among the lay population. By synthesising the available evidence, this review aims to support a better understanding of current educational priorities while identifying areas requiring further research and methodological development.

Ultimately, the findings of this review are intended to contribute to the growing body of knowledge on disaster preparedness education by providing an evidence-informed synthesis of the principal training needs, the educational approaches currently described in the literature and the major gaps that continue to characterise this field. Such evidence may support researchers, healthcare professionals, educators and policy makers in the future development of disaster preparedness education programmes that are responsive to the needs of the lay population and adaptable to different geographical and organisational contexts.

The considerations presented in the previous sections highlight the need for a comprehensive understanding of the training needs required to strengthen disaster preparedness and initial emergency response among the lay population. Although international frameworks consistently recognise community preparedness as a key component of disaster risk reduction, the available evidence remains fragmented with regard to the competencies that should be prioritised and the educational approaches most appropriate for promoting these competencies.

Against this background, the present scoping review aims to systematically map the available scientific evidence concerning the training needs of the lay population in disaster preparedness and initial emergency response. Specifically, the review seeks to identify the principal competency areas described in the literature, examine the educational approaches adopted to promote these competencies, identify existing gaps in current knowledge and provide an evidence-informed conceptual basis that may inform future educational initiatives and research in this field.

More specifically, this review aims to:

1. identify the principal training needs of the lay population described in the scientific literature;
2. analyse existing educational interventions and training approaches designed to improve disaster preparedness and initial emergency response among the general population;

3. identify methodological and knowledge gaps in the current evidence base regarding disaster preparedness education for the lay population;
4. develop a structured conceptual mapping of the principal training needs emerging from the literature to support future research and inform the development of evidence-informed disaster preparedness training programmes for lay populations at the community level.

By establishing an evidence-informed understanding of the training needs of the lay population, this review seeks to contribute to the development of more effective disaster preparedness training strategies capable of strengthening community preparedness, supporting community-level emergency response and enhancing overall community resilience.

1. Aim and Objective

The aim of this thesis is to map the training needs of the lay population in disaster preparedness and initial emergency response, based on the analysis of the available scientific literature.

Despite increasing international attention toward community preparedness and disaster risk reduction, the training needs of the general population remain insufficiently systematised in the literature. For this reason, a scoping review was conducted to identify and synthesise the evidence related to training interventions, educational strategies and competency needs aimed at improving population preparedness for emergencies and disasters.

More specifically, this study aims to:

1. identify the main training needs of the lay population described in the scientific literature;
2. analyse existing training interventions and educational programmes related to disaster preparedness for the general population;
3. identify potential gaps in community preparedness training;
4. develop a structured mapping of training needs related to disaster preparedness and initial emergency response.

The results of this review aim to provide a conceptual overview of the competencies required by the general population in disaster contexts and to contribute to the development of future educational interventions aimed at strengthening community preparedness.

2. Methods

2.1. Study design

The present study adopts a scoping review approach with the aim of mapping the main training needs of the lay population in relation to preparedness and initial response to emergencies and disasters.

A scoping review represents a methodological approach particularly suited to exploring broad and heterogeneous bodies of literature, allowing researchers to identify key concepts, types of available evidence and existing gaps in research. Unlike traditional systematic reviews, which generally aim to assess the effectiveness of specific interventions, scoping reviews are designed to provide an overview of the existing literature within a given field and to clarify emerging thematic areas (Munn et al., 2018).

The review was conducted following the methodological framework for scoping studies originally proposed by Arksey and O'Malley (Arksey & O'Malley, 2005) and further refined by Levac et al. (Levac et al., 2010). In addition, the reporting and selection process of the studies was guided by the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) checklist in order to ensure transparency and reproducibility in the search and selection procedures (Tricco & et al, 2018).

2.2. Research Question

The research question of this review was developed using the PCC framework (Population, Concept, Context), which is commonly employed in scoping reviews to structure the key elements of the investigation in a clear and systematic way ("Scoping Reviews, 2020).

The PCC framework allows the identification and delimitation of the three fundamental components of the research question: the population of interest, the concept under investigation and the context in which the phenomenon is analysed.

- Population: the population of interest consists of the lay population, defined as individuals who do not possess specific professional training in healthcare, emergency response, or civil protection.
- Concept: the concept explored in this review concerns the training needs and competencies required by the general population to face the early phases of emergencies and disasters. In particular, the focus is placed on competencies related to individual and community preparedness, the recognition of risk situations, the adoption of self-protective behaviours and the activation of initial response actions.
- Context: the context considered includes emergency and disaster situations, such as natural disasters, public health crises, extreme weather events and other situations that may have a significant impact on community health and safety.

Based on these elements, the research question guiding this review was formulated as: “What are the main training needs of the lay population for preparedness and initial response to emergencies and disasters?”.

2.3. Search strategy

The literature search was conducted using the PubMed/MEDLINE database. The search strategy was developed using the Advanced Search function in order to systematically combine the search terms and ensure the reproducibility of the process.

Search terms were progressively inserted by selecting the Title/Abstract field and combined using Boolean operators (AND, OR), in order to identify studies related to the main concepts of the review: disaster preparedness, the general population and training interventions.

The following search string was used: *((("Disaster Preparedness"[Mesh] OR "disaster preparedness" OR "emergency preparedness")) AND (("lay population"[Title/Abstract] OR "general population"[Title/Abstract] OR public[Title/Abstract])) AND ((training[Title/Abstract] OR education[Title/Abstract] OR "disaster*

education"[Title/Abstract])) AND (("first aid"[Title/Abstract] OR "emergency response"[Title/Abstract]))

The application of the search string yielded 133 results.

Subsequently, a time filter was applied by limiting the search to articles published between 2015 and 2026, in order to include the most recent evidence available in the literature. This decision was also motivated by the adoption of the Sendai Framework for Disaster Risk Reduction (2015–2030), which has promoted a renewed international focus on strengthening disaster preparedness strategies among communities and the general population.

After applying the time restriction, the total number of records identified was 83 and were retained for screening.

2.4. Databases

The literature search was conducted primarily in the PubMed/MEDLINE database, which was selected because it represents one of the main international sources of scientific literature in the biomedical, healthcare and public health fields, as described by the National Center for Biotechnology Information (NCBI) (National Center for Biotechnology Information, 2025).

The choice of PubMed was motivated by its particular relevance to the objectives of the present review, as it contains a wide range of peer-reviewed articles related to disaster medicine, health preparedness, healthcare training and emergency management. Furthermore, the database allows the use of controlled vocabulary (MeSH terms) and advanced search filters, which contribute to greater accuracy in identifying relevant studies.

The use of PubMed therefore enabled the identification of several relevant articles addressing general population preparedness, the training needs of the lay population and the competencies required for the initial response to emergencies and disasters.

2.5. Inclusion and exclusion criteria

In order to ensure the relevance of the selected studies to the objectives of the present review, specific inclusion and exclusion criteria were defined and applied during the article selection process.

The definition of these criteria was guided by the objectives of the study and by the Population–Concept–Context (PCC) framework, which is commonly used in scoping reviews to systematically identify relevant studies. In this study, the population refers to the lay population or general population, the concept concerns training, education and preparedness competencies in the field of emergencies and disasters, while the context includes health emergencies, natural disasters and other critical events.

The use of this framework allowed the selection process to focus on literature that is most consistent with the objectives of the research, while also ensuring transparency and reproducibility of the study selection process.

Studies were included in the review if they met the following criteria:

1. scientific articles published in peer-reviewed journals;
2. studies published between 2015 and 2026, in order to include the most recent evidence available in the literature;
3. studies addressing disaster or emergency preparedness;
4. studies analysing or describing training interventions, educational programmes, or training needs targeting the general population or lay population;
5. articles available in the English language;
6. articles with full-text availability.

The temporal restriction to the last ten years was also applied in light of the adoption of the Sendai Framework for Disaster Risk Reduction (2015–2030) (United Nations Office for Disaster Risk Reduction, 2015), which strengthened international attention toward the role of communities and populations in disaster preparedness and emergency management.

The following studies were excluded from the review:

1. studies focusing exclusively on healthcare professionals, emergency responders, or specialised personnel without reference to the general population;
2. articles addressing exclusively clinical or hospital-based aspects of emergency management;
3. studies not relevant to training or preparedness of the general population;
4. editorials, commentaries, letters, or articles lacking useful data for the purposes of this review.

The application of these criteria allowed the selection of studies most relevant to the objectives of the research and ensured greater consistency in the analysis of the results.

To ensure consistency and transparency in the study selection process, a screening checklist based on the defined inclusion and exclusion criteria was developed. This checklist was used as an operational tool to systematically evaluate the articles identified through the literature search. The use of this instrument allowed a structured verification of the relevance of each study in relation to the objectives of the review and facilitated the selection of studies to be included in the analysis (Table 1).

Table 1: *Screening checklist used for study selection*

Inclusion criteria	Exclusion criteria
☐ Articles published in peer-reviewed journals	☐ Articles focusing only on healthcare professionals
☐ Publication year between 2015 and 2026	☐ Articles focusing exclusively on clinical or hospital-based emergency management
☐ Studies addressing disaster or emergency preparedness	☐ Studies not related to training or preparedness

☐ Studies analysing training programmes	☐ Editorials or opinion papers
☐ Studies involving lay population	☐ Studies not involving the general population
☐ English articles with full-text availability	☐ Articles without full text

2.6. Study selection process

The study selection process was conducted through several sequential phases in order to ensure a systematic and transparent evaluation of the articles identified through the literature search.

In the first phase, the articles identified through the search string in the PubMed/MEDLINE database were collected and reviewed. Any duplicate records were identified and removed before starting the screening process.

Subsequently, an initial title screening was conducted, during which articles clearly not relevant to the objectives of the review were excluded. This phase allowed a first reduction in the number of identified studies.

In a second phase, a more detailed evaluation was carried out through the reading of the abstracts, in order to verify the relevance of the articles according to the previously defined inclusion and exclusion criteria. Articles that did not meet these criteria were excluded from the review.

Studies considered potentially relevant were then subjected to a full-text review. This phase allowed a more in-depth evaluation of the content of the studies and confirmed their actual relevance to the topic of training the lay population in disaster preparedness and initial emergency response.

Throughout the selection process, the screening checklist based on the inclusion and exclusion criteria was used in order to ensure consistency and transparency in the evaluation of the studies (see Table 1).

Overall, the literature search initially identified 133 articles. After applying the temporal filter covering the years 2015–2026, the number of articles was reduced to 83 studies, which were subsequently subjected to the screening process.

The overall process of identification, screening and selection of studies will be represented through a PRISMA flow diagram, which allows a clear and transparent description of the different phases of study selection.

2.7. Data extraction

After completing the study selection process, the data extraction phase was conducted in order to systematically collect the main information contained in the articles included in the review.

In scoping reviews, the data extraction stage represents a fundamental step for organising and synthesising the information derived from the selected studies, allowing for subsequent thematic analysis and mapping of the available evidence in the literature (Arksey & O'Malley, 2005; Levac et al., 2010).

To ensure consistency and uniformity in the analysis of the studies, a data extraction table was developed and used as an operational tool to record the relevant information from each selected article.

For each study, the following key information was collected:

- author and year of publication;
- country or geographical context of the study;
- study design;
- population involved;
- study objectives;

- type of training intervention or educational programme described;
- main findings related to training or training needs of the population;
- potential recommendations or implications for population preparedness.

The use of a structured table allowed the systematic organisation of data from the selected studies and facilitated the process of thematic analysis and mapping of training needs emerging from the literature.

This approach is consistent with methodological recommendations for scoping reviews, which suggest the use of standardised tools for the collection and synthesis of data from the studies included in the review.

2.8. Data Analysis

Following the completion of the data extraction phase, the information collected from the included studies was analysed through a qualitative thematic analysis, aimed at identifying and organising the main themes emerging from the literature regarding the training needs of the lay population in disaster preparedness and initial emergency response.

In scoping reviews, data analysis is intended to systematically synthesise and organise the evidence available in the literature, allowing the identification of recurring patterns, thematic areas and knowledge gaps (Arksey & O'Malley, 2005; Levac et al., 2010). In the present study, the analysis was conducted using a descriptive and interpretative approach, consistent with the objective of mapping the training needs of the general population in emergency and disaster contexts.

In the first phase, the information extracted from the selected studies was reviewed in order to identify the main contents related to training of the lay population, competencies considered necessary for disaster preparedness and potential training gaps highlighted in the literature.

Subsequently, relevant information was progressively coded and grouped into thematic categories, through an iterative process of reading and comparison across the included studies. This process allowed the identification of the main competency areas and training needs most frequently reported in the scientific literature.

The identified thematic categories were then used to develop a mapping of training needs of the lay population, with particular reference to competencies required during the preparedness phase and the initial response to emergencies and disasters.

Thematic analysis therefore allowed the synthesis of evidence derived from the selected studies and the organisation of the findings into a conceptual structure describing the main training needs of the lay population in disaster preparedness.

This approach not only allows the summarisation of existing knowledge in the literature but also highlights potential gaps in community training, contributing to the identification of priority areas for future educational interventions and preparedness programmes at the territorial level (Braun & Clarke, 2006).

The complete screening table, the characteristics of the included studies, the study–theme matrix and the thematic frequency analysis are provided in the Appendices to enhance transparency and reproducibility of the review process.

3. Results

3.1. Study Selection

The literature search conducted in the PubMed/MEDLINE database initially identified 133 records potentially relevant to the objectives of this review. Subsequently, a time filter was applied, limiting the search to studies published between 2015 and 2026, in accordance with the predefined inclusion criteria and with the aim of considering the most recent literature published following the adoption of the Sendai Framework for Disaster Risk Reduction (2015–2030). After applying this restriction, 83 articles remained and were subjected to the screening process.

The study selection process was conducted through a progressive multi-stage procedure. In the first phase, the titles of the identified records were reviewed in order to exclude studies that were clearly not relevant to the objectives of the review. Subsequently, the abstracts of potentially relevant studies were assessed to verify their consistency with the PCC framework (Population, Concept, Context) and with the predefined inclusion and exclusion criteria.

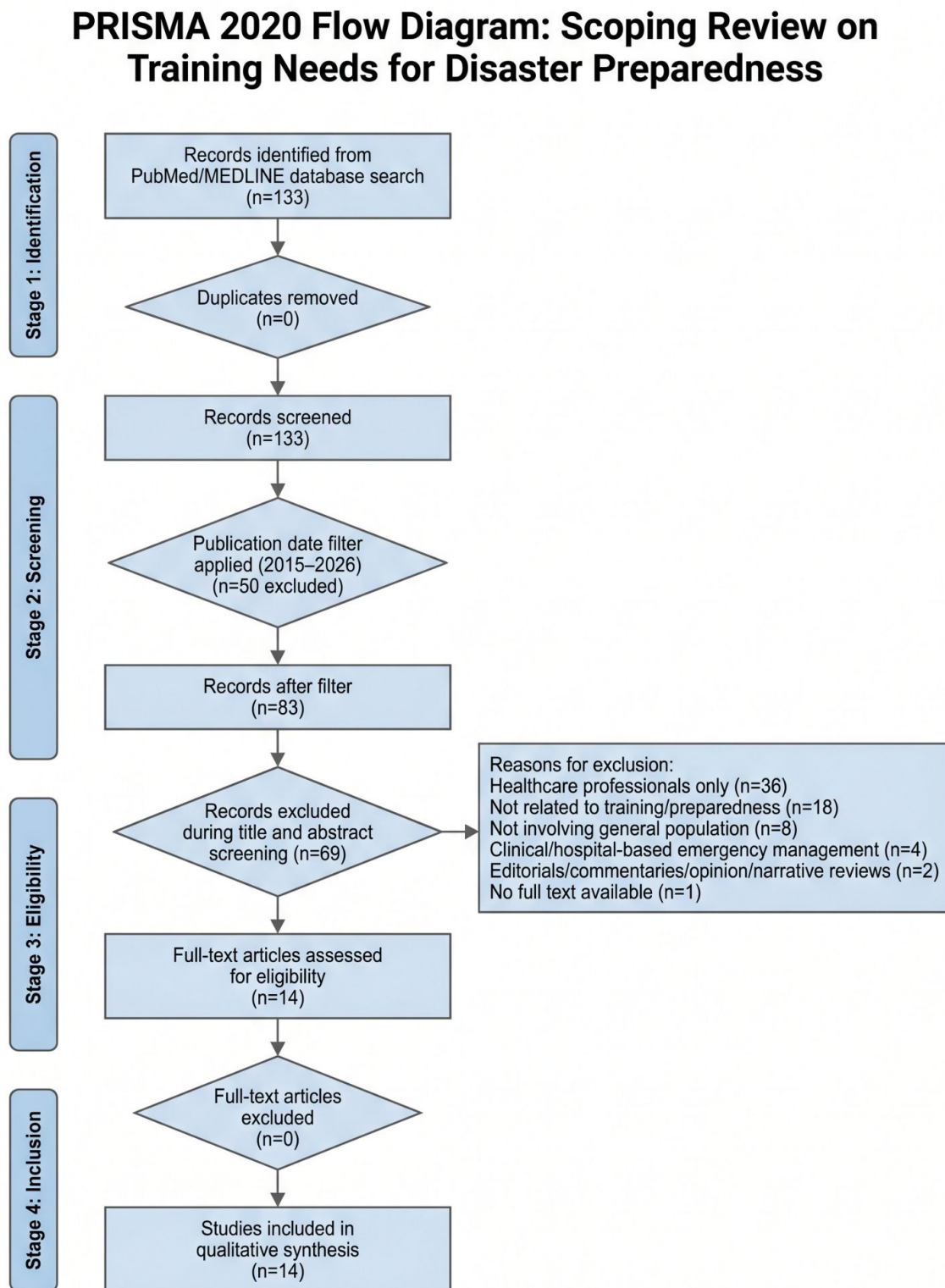
Articles considered potentially eligible were then subjected to full-text review. This phase allowed a more detailed assessment of the relevance of the studies with regard to the target population, the emergency and disaster context and the presence of content related to training needs, educational interventions, or preparedness competencies among the general population.

At the end of the screening process, 69 studies were excluded. The most common reason for exclusion was the exclusive focus on healthcare professionals, emergency responders, or other specialised personnel without involving the general population ($n = 36$). Additional studies were excluded because they were not related to training or preparedness ($n = 18$), did not involve the general population ($n = 8$), focused exclusively on clinical or hospital-based aspects of emergency management ($n = 4$), were classified as editorials, commentaries, or opinion papers ($n = 2$), or because the full text was not available ($n = 1$).

Overall, 14 studies met all inclusion criteria and were therefore included in the final review. The selected studies were subsequently subjected to data extraction and analysis in order to identify the main training needs and preparedness competencies described in the literature.

The process of identification, screening, eligibility assessment and study inclusion is presented in the PRISMA flow diagram (Figure 1).

Figure 1: PRISMA 2020 flow diagram illustrating the identification, screening, eligibility assessment and inclusion of studies investigating the training needs of the lay population for disaster preparedness and initial emergency response.



3.2. Characteristics of the Included Studies

The fourteen studies included in this scoping review were published between 2015 and 2026 and showed considerable heterogeneity in terms of geographical context, study design, target population and type of educational intervention.

From a geographical perspective, the studies were conducted across different regions of the world, including China, Thailand, Indonesia, Turkey, Saudi Arabia, the United States and Brazil. In addition, some studies adopted an international or multi-country perspective, particularly those examining educational methodologies or disaster preparedness programmes implemented across different settings. This geographical distribution highlights the growing international interest in strengthening community preparedness and resilience in the face of disasters and public health emergencies.

A variety of methodological approaches were identified among the included studies, including cross-sectional surveys, community-based educational interventions, randomized controlled trials, Delphi studies, methodological framework studies, programme evaluations and literature reviews. This methodological diversity allowed disaster preparedness to be explored from different perspectives, including both the assessment of training needs and the evaluation of educational interventions aimed at improving preparedness among the lay population.

The populations involved were equally diverse. While most studies focused on the general population or local communities exposed to specific hazards, several studies targeted particular population groups, including adult women, vulnerable adolescents, students, school teachers, community volunteers and residents living in disaster-prone areas. This diversity reflects the need to tailor preparedness programmes to the specific characteristics and training needs of different population groups.

The educational interventions described in the included studies encompassed disaster preparedness education programmes, first aid and cardiopulmonary resuscitation (CPR/BLS) training, Community Emergency Response Team (CERT) programmes,

community awareness initiatives, emergency drills and exercises, immersive virtual reality-based simulations and community resilience-building activities. Overall, the studies reported that educational interventions and preparedness training were associated with improvements in knowledge, risk awareness, practical skills, preparedness behaviours and community engagement in emergency and disaster response.

A detailed summary of the characteristics of the included studies is presented in Table 2.

Table 2: *Characteristics of the studies included in the review (n = 14)*

Author (Year)	Country	Study Design	Population	Hazard / Context	Main Outcomes Measured
Shannon (2015)	United States	Conceptual / Narrative Review	General population and local communities	Multiple disasters	Community preparedness, community resilience, community engagement
Ossey et al. (2017)	United States	Community- Based Educational Intervention	High-risk adolescents	Multiple disasters	First aid knowledge, preparedness skills, self-efficacy

Author (Year)	Country	Study Design	Population	Hazard / Context	Main Outcomes Measured
Ning et al. (2021)	China	Cross-Sectional Survey	2,506 adults from three Chinese provinces	General emergencies	Preparedness behaviours, risk perception
Luo et al. (2021)	China	Methodological Study	General population	Emerging infectious diseases	Knowledge acquisition, decision-making skills, preparedness
Wei et al. (2023)	China	Delphi Study	Expert panel	Emerging infectious diseases outbreaks	Health literacy, risk perception, preparedness indicators
Pamungkas et al. (2023)	Indonesia	Cross-Sectional Community Survey	Community residents from earthquake-prone villages	Earthquakes	Preparedness level, emergency planning, resource preparedness

Author (Year)	Country	Study Design	Population	Hazard / Context	Main Outcomes Measured
Kimura et al. (2024)	Multiple Countries	Scoping Review	General population, students and community participants	Multiple disasters	Disaster awareness, learner engagement
Alshammari et al. (2025)	Saudi Arabia	Cross-Sectional Study	General population	Out-of-hospital medical emergencies	CPR knowledge, CPR awareness
Carvalho Castanha et al. (2025)	Brazil	Educational Framework Study	School teachers	Out-of-hospital medical emergencies	BLS knowledge, practical skills, educational implementation
Jin et al. (2025)	China	Cross-Sectional Study	Community volunteers and general population	Respiratory infectious disease outbreaks	Volunteer participation, community engagement, practical skills

Author (Year)	Country	Study Design	Population	Hazard / Context	Main Outcomes Measured
Parada - Espinosa et al. (2025)	Multiple Countries	Systematic Review	Secondary school students	School emergencies	First aid knowledge, practical skills
Jafar et al. (2026)	Conflict Zones	Intervention al Training Study	Civilians living in conflict settings	Armed conflict	First aid knowledge, emergency response skills
Sögüt & Kiliçarslan (2026)	Turkey	Randomized Controlled Trial	Adult women	Multiple disasters	Disaster awareness, preparedness level
Thronsao et al. (2026)	Thailand	Community- Based Intervention Study	Communities exposed to flood risk	Floods	Community participation, preparedness behaviours, community resilience

3.3. Main Training Needs identified across the included studies

The thematic analysis of the fourteen studies included in this scoping review identified the principal training needs described in the literature regarding disaster preparedness and initial emergency response among the lay population. Although the studies exhibited considerable heterogeneity in terms of geographical setting, target population, methodological approach and type of educational intervention, several recurring themes emerged across the evidence, allowing the identification of common competency areas.

The identified training needs encompass both theoretical knowledge and practical competencies required to enhance the ability of individuals and communities to cope with emergency and disaster situations. In particular, the studies highlighted the need to strengthen risk awareness and hazard recognition, develop first aid and emergency response skills, promote preparedness activities at the individual, household and community levels and encourage active citizen participation in disaster preparedness processes.

To provide an overview of the training areas most frequently represented in the literature, the frequency with which each thematic area emerged across the included studies was also examined. This approach allowed not only the identification of the main categories of training needs, but also an assessment of their recurrence within the available evidence.

Through the thematic analysis process, four principal training need areas were identified, representing the competencies most frequently reported across the included studies. The most frequently identified training need areas were Disaster Awareness and Risk Perception and Household and Community Preparedness, both reported in 7 studies (50.0%). These were followed by First Aid and Emergency Response Skills, identified in 5 studies (35.7%) and Community Resilience and Citizen Engagement, identified in 4 studies (28.6%).

To further illustrate how the identified thematic areas were distributed across the included studies, Figure 2 presents a heatmap showing the relationship between each study and the four principal thematic areas emerging from the thematic analysis.

Figure 2: Heatmap illustrating the relationship between the included studies and the four principal training need areas identified through thematic analysis.

Study	Authors	A. Disaster Awareness & Risk Perception	B. First Aid & Emergency Response Skills	C. Household & Community Preparedness	D. Community Resilience & Citizen Engagement
First aid training in conflict zones: An interventional training study and a post-training knowledge assessment.	Jafar, K., Janoud, R., Sheikh Sobeh, A., Al-Deeb, R., & Janoud, O.				
The Effect of Awareness-Based Disaster Education on Women's Disaster Awareness and Preparedness: A Randomized Controlled Study.	Sögüt, S. C., & Kiliçarslan, T.				
Building Resilient Communities: A Participatory Approach to Flood Disaster Preparedness in Thailand.	Thronsao, M., Chaiyaprom, K., Thronsao, C., Sripol, C., Chanthamath, S., & Wongkongdech, R.				
A practice-oriented framework for basic life support training of Brazilian school teachers: integrating Law 13,722/2018, andragogy, and the health belief model.	Carvalho Castanha, C. S., Guerrero Daboin, B. E., Zangirolami-Raimundo, J., Barbosa Tavares, L. F., de Abreu, L. C., & Raimundo, R. D.				
Community volunteer participation and its determinants during respiratory infectious disease outbreaks in China: A cross-sectional study across multiple provinces.	Jin, H., Ding, X., Li, Z., Cao, J., Sun, X., Ji, Y., & Ning, F.				
Teaching Methodologies for First Aid in Physical Education in Secondary Schools: A Systematic Review.	Parada-Espinosa, J. M., Ortega-Gómez, S., Ruiz-Muñoz, M., & González-Silva, J.				
Knowledge and Awareness About the Basics of Cardiopulmonary Resuscitation in the Saudi Population.	Alshammari, S., Alshammari, A. H., Aldosari, M., Aldawsari, H. A., & Almass, A.				
Scoping Review of Virtual Reality (VR)-Based Disaster Mitigation Education.	Kimura, R., Fukushima, A., Kajiwara, K., Sakuramoto, H., Yoshihara, S., Harada, K., Nakayama, T., & Ito, A.				
Preparedness of the community in facing disasters like earthquakes (Case: Cisarua, Indonesia).	Pamungkas, T. D., Aliyan, S. A., Nurfalah, I., Ningrum, E., & Maryani, E.				
Constructing an emergency preparedness evaluation index system for public use during major emerging infectious disease outbreaks: a Delphi study.	Wei, W., Liu, Y., Zhou, N., Tian, M., Xie, L., Watson, R., Dai, F., Chen, Y., & Hu, W.				
Design of a Virtual Reality Interactive Training System for Public Health Emergency Preparedness for Major Emerging Infectious Diseases: Theory and Framework.	Luo, Y., Li, M., Tang, J., Ren, J., Zheng, Y., Yu, X., Jiang, L., Fan, D., & Chen, Y.				
Factors Associated With Individual Emergency Preparedness Behaviors: A Cross-Sectional Survey Among the Public in Three Chinese Provinces.	Ning, N., Hu, M., Qiao, J., Liu, C., Zhao, X., Xu, W., Xu, W., Zheng, B., Chen, Z., Yu, Y., Hao, Y., & Wu, Q.				
Community Emergency Response Team (CERT) Training of High-Risk Teens in the Community of Watts, South Los Angeles, 2013-2014.	Ossey, S., Sylvers, S., Oksuzyan, S., Smith, L. V., Frye, D., Family, L., Scott, J., & King, J. B.				
Understanding Community-Level Disaster and Emergency Response Preparedness.	Shannon C.				

Green cells indicate that the corresponding thematic area was identified within the study, whereas white cells indicate that the thematic area was not reported.

Taken together, the findings presented in Figure 2 provide a structured overview of how the principal training need areas were distributed across the included studies. Moreover, the specific competencies associated with each thematic area are summarised in Table 3 and described in detail in the following sections.

Table 3: *Principal training need areas and associated competencies identified through thematic analysis.*

Thematic Area	Specific Competencies Identified
Disaster Awareness and Risk Perception	Competencies related to hazard recognition, risk awareness, understanding of disaster threats and adoption of self-protective behaviours.
First Aid and Emergency Response Skills	Competencies related to basic first aid, cardiopulmonary resuscitation (CPR), basic life support (BLS) and immediate response actions before professional assistance arrives.
Household and Community Preparedness	Competencies related to preparedness planning, emergency kits, household readiness, community preparedness activities and emergency drills.
Community Resilience and Citizen Engagement	Competencies related to community participation, volunteer engagement,

	social support networks and resilience-building activities.
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The table summarises the principal training need areas identified through thematic analysis together with the specific competencies associated with each area. The competencies represent a conceptual synthesis of the evidence emerging from the included studies.

3.3.1. Disaster Awareness and Risk Perception

The first thematic area identified through the analysis concerns disaster awareness and risk perception, which was reported in 7 of the 14 studies included in this scoping review (50.0%). This category encompasses the competencies required to recognise potential hazards, understand the risks associated with different emergency scenarios and adopt appropriate self-protective behaviours.

Overall, the included studies consistently indicate that higher levels of disaster awareness and risk perception are associated with greater individual and community preparedness. In particular, several authors identified knowledge of hazards, the ability to recognise potentially dangerous situations and an understanding of protective measures as fundamental components for promoting preparedness behaviours among the lay population (Shannon, 2015; Pamungkas et al., 2023; Wei et al., 2023).

Studies conducted in different geographical settings further demonstrated that community preparedness is often limited by insufficient knowledge of local hazards and inadequate familiarity with emergency response procedures. Pamungkas et al. (2023), investigating communities exposed to earthquake risk in Indonesia, reported predominantly low to moderate levels of preparedness, highlighting deficiencies in emergency planning, early warning systems and resource mobilisation. Similarly, Wei et al. (2023), through the development of an emergency preparedness evaluation index for the public during emerging infectious disease outbreaks, identified knowledge, health literacy, risk perception, response capacity and resource preparedness as essential dimensions of public preparedness.

Several studies also demonstrated the effectiveness of educational interventions specifically designed to improve disaster awareness. In particular, the randomized controlled trial conducted by Söğüt and Kiliçarslan (2026) showed that an awareness-based disaster education programme significantly improved participants' levels of disaster awareness and preparedness. Comparable findings emerged from studies evaluating innovative educational strategies. Luo et al. (2021) developed an immersive

virtual reality training system aimed at enhancing knowledge, decision-making skills and risk awareness in public health emergencies, while the scoping review by Kimura et al. (2024) highlighted that virtual reality-based disaster education promotes experiential learning, increases learner engagement and enhances the understanding of disaster consequences and appropriate response behaviours.

Beyond individual educational interventions, several studies emphasised the importance of community involvement in strengthening disaster awareness. Shannon (2015) described preparedness as a community-wide process influenced not only by individual knowledge but also by social networks, risk communication, community engagement and the availability of local resources. Likewise, Thronsao et al. (2026) demonstrated that a participatory approach to flood preparedness in Thailand improved disaster awareness, increased participation in preparedness activities and promoted the adoption of preventive behaviours within the community.

Overall, the available evidence indicates that disaster awareness and risk perception constitute one of the most frequently reported training need areas in the analysed literature. Although the included studies were conducted in different countries and addressed diverse emergency scenarios, they consistently highlighted the need for educational interventions aimed at improving hazard recognition, understanding of disaster risks and the adoption of appropriate self-protective and preparedness behaviours among the lay population.

3.3.2. First Aid and Emergency Response Skills

The second thematic area identified through the analysis concerns first aid and emergency response skills, which were reported in 5 of the 14 studies included in this scoping review (35.7%). This category encompasses the competencies required to provide immediate assistance during emergency situations, including first aid, cardiopulmonary resuscitation (CPR), Basic Life Support (BLS) and the appropriate activation of emergency medical services before the arrival of professional responders.

Overall, the included studies identify first aid education as an essential component of disaster preparedness for the lay population. Regardless of the context in which the educational interventions were implemented, the evidence consistently shows that structured training programmes improve participants' theoretical knowledge, practical skills and confidence in managing emergency situations (Ossey et al., 2017; Jafar et al., 2026; Carvalho Castanha et al., 2025; Parada-Espinosa et al., 2025; Alshammari et al., 2025).

Several studies highlighted the importance of implementing first aid training programmes within community settings. Ossey et al. (2017) demonstrated that a Community Emergency Response Team (CERT) programme, incorporating first aid and cardiopulmonary resuscitation training, enabled adolescents from high-risk communities to acquire practical competencies that could be used to assist themselves, their families and their communities during emergencies. Similarly, Jafar et al. (2026), evaluating a first aid training programme implemented in conflict settings, reported a significant improvement in participants' knowledge following the educational intervention, suggesting that structured training programmes can strengthen civilians' ability to manage the initial stages of traumatic emergencies when access to professional healthcare services is limited or delayed.

School settings also emerged as an important environment for strengthening emergency response competencies. Carvalho Castanha et al. (2025) proposed a practice-oriented framework for Basic Life Support training for Brazilian school teachers, emphasising the importance of integrating practical exercises with andragogical principles and the Health Belief Model to enhance participant engagement and learning effectiveness. Similarly, the systematic review conducted by Parada-Espinosa et al. (2025) found that active teaching methodologies, including simulation-based learning and practical exercises, were consistently associated with improved acquisition and retention of first aid knowledge and skills among secondary school students.

The analysed studies also revealed persistent gaps in basic first aid and cardiopulmonary resuscitation knowledge within the general population. In particular, Alshammari et al.

(2025) identified insufficient knowledge of the fundamental principles of CPR among adults in Saudi Arabia, indicating that essential life-saving competencies remain inadequately disseminated within the community. These findings reinforce the need to expand community-based first aid education programmes and improve public access to emergency response training.

Overall, the available evidence indicates that first aid and emergency response skills represent a fundamental component of disaster preparedness training for the lay population. Although the included studies involved different target groups (including adolescents, teachers, students, civilians living in conflict settings and the general adult population) they consistently reported improvements in participants' knowledge and competencies following structured educational interventions. Collectively, these findings support the systematic integration of practical first aid, CPR/BLS and initial emergency management training into community-based disaster preparedness programmes.

3.3.3. Household and Community Preparedness

The third thematic area identified through the analysis concerns household and community preparedness, which was reported in 7 of the 14 studies included in this scoping review (50.0%). This category encompasses the set of competencies and activities aimed at preparing individuals and communities to cope with emergencies before they occur, including emergency planning, resource preparedness, knowledge of emergency procedures and participation in preparedness activities.

Overall, the included studies indicate that preparedness is a multidimensional process that extends beyond the acquisition of theoretical knowledge, encompassing the ability to plan, organise and implement preventive actions at both the individual and community levels. Several authors emphasised that higher levels of preparedness are associated with an improved capacity to respond during the initial stages of an emergency and with greater community resilience (Shannon, 2015; Ning et al., 2021; Wei et al., 2023).

Several studies identified emergency planning as one of the core components of preparedness. In particular, Ning et al. (2021) reported that the adoption of individual

preparedness behaviours is influenced by multiple factors, including risk perception, knowledge, previous experience and access to information. Similarly, Pamungkas et al. (2023) found that communities exposed to earthquake risk frequently showed deficiencies in emergency planning, resource preparedness and knowledge of evacuation procedures, highlighting the need for educational programmes specifically focused on practical preparedness.

The importance of preparedness also emerged in studies addressing public health emergencies. Wei et al. (2023), in developing an emergency preparedness evaluation index for the public during emerging infectious disease outbreaks, identified resource preparedness, emergency planning and response capacity as key dimensions of individual preparedness. Likewise, Luo et al. (2021) proposed a virtual reality training system designed not only to improve knowledge but also to strengthen decision-making skills and public preparedness for complex public health emergency scenarios.

Further evidence suggests that educational interventions can significantly improve preparedness levels within the general population. Sögüt and Kiliçarslan (2026) demonstrated that an awareness-based disaster education programme significantly increased participants' preparedness levels. Similarly, Thronsao et al. (2026) reported that a participatory approach to flood preparedness promoted greater community involvement in planning activities, improved individual preparedness and strengthened collective response capacity to extreme events.

Finally, Shannon (2015) emphasised that preparedness should be regarded as a continuous process involving individuals, families, organisations and communities. According to the author, effective preparedness requires coordination among citizens, institutions and local networks, highlighting preventive planning as a fundamental component for reducing the impact of disasters and improving the population's response during the early stages of emergencies.

Overall, the available evidence indicates that household and community preparedness represents one of the most frequently reported training need areas in the analysed literature. Collectively, the included studies demonstrate that preparedness depends not

only on the availability of information but also on structured educational interventions, emergency planning activities and the active involvement of communities in order to develop the competencies required to respond more effectively and efficiently to emergencies and disasters.

3.3.4. Community Resilience and Citizen Engagement

The fourth thematic area identified through the analysis concerns community resilience and citizen engagement, which was reported in 4 of the 14 studies included in this scoping review (28.6%). This category encompasses the competencies, attitudes and strategies aimed at promoting public participation in preparedness activities, fostering collaboration among citizens, organisations and institutions and strengthening the collective capacity of communities to respond to emergencies.

Overall, the included studies indicate that disaster preparedness should not be regarded solely as an individual responsibility but as a shared process requiring the active involvement of the community. Citizen participation in prevention, planning and emergency response activities emerged as a recurring element in strategies designed to enhance community resilience and strengthen collective preparedness for disasters (Shannon, 2015; Jin et al., 2025; Thronsao et al., 2026).

Several studies emphasised that community engagement promotes not only the acquisition of knowledge but also the development of social networks and mutual support systems. Shannon (2015) described preparedness as a community-wide process involving citizens, local organisations and public institutions, highlighting that trust, shared responsibility and collaborative relationships are fundamental components of an effective emergency response. Similarly, Thronsao et al. (2026) demonstrated that a participatory approach to flood preparedness increased community involvement in planning activities and strengthened the collective capacity to respond to flood-related emergencies.

The importance of community participation was also highlighted by Jin et al. (2025), who investigated the determinants of volunteer participation during respiratory infectious disease outbreaks in China. Their findings showed that individuals' willingness to engage

in volunteer activities was influenced by personal, social and organisational factors, suggesting that strengthening community resilience requires not only opportunities for participation but also educational interventions and engagement strategies capable of encouraging active civic involvement.

Additional evidence was provided by the Community Emergency Response Team (CERT) programme described by Ossey et al. (2017). Beyond the acquisition of technical first aid and emergency response skills, the programme aimed to promote civic responsibility and collaboration among community members during emergencies. This approach illustrates how educational programmes can contribute to strengthening community resilience by encouraging active citizen participation and shared responsibility in disaster response.

Overall, the available evidence suggests that community resilience represents a fundamental dimension of disaster preparedness. Collectively, the included studies indicate that educational programmes promoting citizen participation, volunteerism and collaboration between communities and institutions can strengthen the collective capacity to prepare for, respond to and recover from emergencies and disasters.

3.4. Educational Approaches Supporting Disaster Preparedness Training

While the thematic analysis presented in Section 3.3 identified the principal training needs required to strengthen disaster preparedness and initial emergency response among the lay population, the included studies also provided valuable information on how these competencies were taught through different educational interventions. Accordingly, this section focuses on the educational approaches adopted within the training programmes identified in the literature, complementing the thematic mapping of training needs by describing the methodologies used to support competency development.

Overall, four of the fourteen included studies described in detail the educational methodologies adopted within their respective training programmes (Luo et al., 2021;

Kimura et al., 2024; Carvalho Castanha et al., 2025; Parada-Espinosa et al., 2025). Despite differences in implementation settings and target populations, these interventions shared the common objective of promoting more active, practice-oriented and contextualised learning compared with traditional lecture-based educational models.

Among the educational approaches identified, simulation and immersive technologies emerged as the most frequently described strategies. Luo et al. (2021) developed a virtual reality training system for public health emergency preparedness, designed to allow participants to engage with realistic emergency scenarios within a safe and controlled environment. Similarly, the scoping review conducted by Kimura et al. (2024) identified virtual reality as a promising educational tool for disaster mitigation education, highlighting its potential to promote experiential learning through the simulation of complex disaster scenarios.

Alongside digital technologies, the included studies emphasised the value of practice-oriented educational methodologies. Carvalho Castanha et al. (2025) proposed a Basic Life Support educational framework integrating practical exercises, principles of andragogy and the Health Belief Model to enhance learner engagement and improve educational effectiveness. Likewise, the systematic review by Parada-Espinosa et al. (2025) reported that active learning strategies (including simulation, practical exercises, collaborative learning and experiential activities) were consistently associated with improved acquisition of first aid competencies when compared with traditional instructional approaches.

Overall, the included studies describe a progressive shift towards learner-centred educational models, in which experiential learning, simulation and practical training represent recurring elements of disaster preparedness programmes for the lay population. Although the educational tools and implementation strategies differed across studies, the interventions consistently aimed to facilitate the development of competencies applicable to real-world emergency and disaster situations.

4. Discussion

4.1. Interpretation of the Principal Findings

The present scoping review synthesised the available evidence regarding the training needs of the lay population for disaster preparedness and initial emergency response. Despite the methodological and geographical heterogeneity of the included studies, a substantial convergence emerged regarding the competencies considered essential to strengthen public preparedness. Overall, the reviewed studies describe disaster preparedness as a multidimensional construct that integrates theoretical knowledge, practical skills, decision-making abilities, risk awareness and active community participation (Shannon, 2015; Ning et al., 2021; Wei et al., 2023; Pamungkas et al., 2023; Jin et al., 2025).

This interpretation is consistent with the principles outlined in the *Sendai Framework for Disaster Risk Reduction 2015–2030*, which identifies understanding disaster risk as the first priority for reducing disaster-related losses and strengthening community resilience (United Nations Office for Disaster Risk Reduction, 2015). Similarly, the *WHO Health Emergency and Disaster Risk Management (Health EDRM) Framework* emphasises that preparedness should not be limited to emergency response capacity alone but should include the continuous development of knowledge, skills and capabilities among the population through an integrated approach involving individuals, households, communities and institutions (World Health Organization, 2019).

One of the most relevant findings emerging from this review is the progressive shift observed in recent literature from a predominantly response-oriented model towards a broader preparedness-focused approach. Although first aid and Basic Life Support remain fundamental components of educational programmes for the lay population (Carvalho Castanha et al., 2025; Parada-Espinosa et al., 2025), the most frequently reported themes across the included studies concerned disaster awareness, household and community preparedness, preventive planning and active community engagement (Wei et al., 2023; Pamungkas et al., 2023; Sögüt & Kiliçarslan, 2026; Thronsao et al., 2026). This trend

reflects a conceptual evolution in disaster preparedness, where the primary objective extends beyond improving emergency response to strengthening the capacity of individuals and communities to anticipate hazards, prepare for adverse events and mitigate their potential consequences.

Another important finding concerns the growing emphasis placed on community participation. Several studies highlighted that disaster preparedness should not be considered solely an individual responsibility but rather a collective process requiring collaboration among citizens, public institutions and local organisations (Shannon, 2015; Ossey et al., 2017; Jin et al., 2025; Thronsao et al., 2026). This perspective is fully aligned with the concept of community resilience promoted by both the Sendai Framework and the WHO Health EDRM Framework, which recognise community engagement as a fundamental component of effective disaster risk reduction and emergency preparedness (United Nations Office for Disaster Risk Reduction, 2015; World Health Organization, 2019).

Finally, this review highlights an evolution in the educational methodologies adopted within disaster preparedness programmes. Although only a limited number of included studies specifically explored educational approaches (Luo et al., 2021; Kimura et al., 2024; Carvalho Castanha et al., 2025; Parada-Espinosa et al., 2025), the available evidence indicates an increasing adoption of simulation-based learning, experiential education and immersive technologies. These approaches appear to reflect a growing recognition that traditional lecture-based education alone may be insufficient to develop the practical and behavioural competencies required during real emergency and disaster situations.

Overall, the findings of the present scoping review suggest that disaster preparedness education for the lay population should be viewed as a continuous and multidimensional process in which knowledge acquisition, practical competencies, preventive preparedness and community participation represent complementary and closely interconnected components. The following sections further explore these themes through a critical comparison with the broader international literature and discuss their implications for the design and implementation of future disaster preparedness education programmes.

4.2. Interpreting the Training Needs of the Lay Population

One of the main contributions of the present scoping review is the identification of the competency areas that the literature considers essential for improving disaster preparedness among the lay population. Although the included studies differed in terms of geographical setting, disaster type and target population, a high degree of consistency emerged regarding four principal training need areas: disaster awareness and risk perception, first aid and initial emergency response skills, household and community preparedness and community resilience with active citizen engagement. This observation is consistent with the recent scoping review by Guo et al. (2025), which describes disaster preparedness education as a multidimensional process integrating knowledge, practical skills, community engagement and innovative educational strategies.

Among these, disaster awareness and risk perception were the most frequently reported themes. The included studies consistently emphasised that understanding disaster risks constitutes the foundation for adopting effective protective behaviours and actively participating in disaster preparedness initiatives (Ning et al., 2021; Wei et al., 2023; Pamungkas et al., 2023; Sögüt & Kiliçarslan, 2026). These findings are fully consistent with the *Sendai Framework for Disaster Risk Reduction 2015–2030*, which identifies understanding disaster risk as the first priority for disaster risk reduction and with the *WHO Health Emergency and Disaster Risk Management (Health EDRM) Framework*, which promotes the development of a preparedness culture through educational programmes targeting the general population (United Nations Office for Disaster Risk Reduction, 2015; World Health Organization, 2019). Likewise, the broader literature highlights effective risk communication as one of the most important strategies for improving both individual and community preparedness by supporting informed decision-making before emergencies occur (Savoia et al., 2013). Similarly, Guo et al. (2025) emphasise that fostering a culture of risk awareness represents one of the core objectives of disaster preparedness education, demonstrating that knowledge acquisition alone is insufficient without simultaneously promoting risk awareness and active community participation.

Another important finding concerns the role of first aid and initial emergency response competencies. Although these skills have traditionally represented the core component of disaster preparedness education for the lay population, the findings of this review suggest that they are increasingly being considered as one element within a broader educational framework rather than the sole objective of preparedness programmes. The studies conducted by Carvalho Castanha et al. (2025), Parada-Espinosa et al. (2025) and Jafar et al. (2026) indicate that first aid education should be integrated with training activities aimed at strengthening decision-making, situational assessment and emergency management capabilities, thereby moving beyond an exclusively technical approach. This evolution is also reflected in the review by Guo et al. (2025), which highlights that contemporary disaster preparedness programmes increasingly integrate technical competencies, decision-making skills and preventive preparedness within comprehensive educational pathways.

A further finding relates to the increasing emphasis placed on household and community preparedness. The frequent identification of this thematic area across the included studies suggests that disaster preparedness is progressively being conceptualised as a process that begins long before an emergency occurs and includes household emergency planning, emergency kit preparation, evacuation procedures and the organisation of available resources (Wei et al., 2023; Pamungkas et al., 2023; Thronsao et al., 2026). This trend reflects a gradual shift from a response-oriented model towards a disaster risk reduction approach, in which preparedness is regarded as a continuous process rather than an activity limited to emergency situations.

Finally, the findings of this review confirm the increasing importance attributed to community resilience and active citizen engagement. The studies by Shannon (2015), Ossey et al. (2017), Jin et al. (2025) and Thronsao et al. (2026) demonstrate that preparedness programmes are more effective when community members actively participate in planning, education and emergency response activities, thereby strengthening collaboration among citizens, healthcare services, public institutions and local organisations. This perspective is consistent with contemporary disaster risk

reduction frameworks, which increasingly recognise communities not merely as recipients of educational interventions but as active partners in building collective resilience.

Taken together, these findings suggest that the training needs of the lay population have progressively expanded beyond traditional first aid education. Disaster preparedness emerges as a complex and multidimensional concept that integrates risk awareness, practical competencies, preventive planning and community participation. This evolution reflects a broader shift in the philosophy of disaster preparedness education, moving towards the development of informed, prepared and actively engaged citizens capable of contributing to the resilience of their communities. This interpretation is further supported by the recent review conducted by Guo et al. (2025), which identifies the integration of knowledge, preparedness, community engagement and innovative educational approaches as the key elements for the development of future disaster preparedness education programmes targeting the general population.

4.3. Implications of Educational Approaches for Disaster Preparedness

The findings of the present scoping review suggest that the effectiveness of disaster preparedness programmes depends not only on the educational content delivered but also on the instructional approaches adopted to develop the competencies of the lay population. While the Results section highlighted the increasing use of simulation, virtual reality, practical exercises and collaborative learning (Luo et al., 2021; Kimura et al., 2024; Carvalho Castanha et al., 2025; Parada-Espinosa et al., 2025), their interpretation suggests a broader evolution in disaster preparedness education, progressively shifting from knowledge transmission towards competency-based learning.

This evolution is closely related to the nature of disaster preparedness itself. The competencies required to effectively manage emergency situations extend beyond theoretical knowledge and include decision-making, problem-solving, effective communication, adaptability and the ability to cope with uncertainty and time pressure. Consequently, educational approaches that promote active participation and experiential

learning appear particularly appropriate for preparing individuals to respond effectively in complex and unpredictable disaster contexts.

Within this perspective, the included studies highlight the growing interest in simulation-based education and immersive technologies. Luo et al. (2021) and Kimura et al. (2024) demonstrated that virtual reality enables the recreation of realistic disaster scenarios within safe and controlled environments, allowing participants to experience decision-making processes and operational responses without exposure to real risks. These findings are consistent with the recent scoping review conducted by García Ulerio et al. (2025), which identified simulation technologies as one of the most promising educational strategies in disaster medicine while also emphasising the need for stronger evidence regarding their long-term effectiveness and for greater standardisation of evaluation methods.

Similarly, the studies conducted by Carvalho Castanha et al. (2025) and Parada-Espinosa et al. (2025) emphasised that practical exercises, scenario-based activities and collaborative learning facilitate not only knowledge acquisition but also the development of the ability to apply acquired competencies in realistic situations. This observation is further supported by the review of Guo et al. (2025), which concluded that the most effective disaster preparedness programmes are those integrating multiple educational strategies capable of simultaneously promoting knowledge, practical competencies and active learner engagement.

This educational philosophy is also consistent with the principles of adult learning described by Knowles et al. (2020), which suggest that adults learn most effectively when actively engaged in meaningful learning experiences, confronted with real-world problems and able to immediately apply newly acquired knowledge and skills. Within the context of disaster preparedness, this approach is particularly relevant because educational programmes should aim not merely to transfer information but to develop competencies that can be effectively applied during real emergency and disaster situations.

It is noteworthy that none of the included studies identified a single educational methodology as universally superior. Rather, the available evidence suggests that educational effectiveness derives from integrating complementary teaching strategies according to learning objectives, contextual factors and the characteristics of the target population. This perspective reflects a broader transformation in the design of disaster preparedness education, moving away from content-centred instruction towards educational models focused on developing practical, behavioural and decision-making competencies.

Overall, the findings of the present review suggest that future disaster preparedness programmes targeting the lay population should prioritise active, contextualised and participatory educational approaches capable of integrating theoretical knowledge, practical competencies and decision-making skills. Nevertheless, the limited number of experimental studies, the heterogeneity of reported outcomes and the scarcity of long-term follow-up studies currently make it difficult to determine which combination of educational strategies is most effective in promoting sustained competency retention and successful transfer of learning to real-world emergency situations. These issues represent important priorities for future research.

4.4. Gaps in the Literature and Future Research

Although the present scoping review highlights the growing attention devoted to disaster preparedness education for the lay population, the analysis of the included studies also revealed several important gaps that limit the ability to determine which educational strategies are most effective. These limitations relate not only to the methodological quality of the available evidence but also to the design, implementation and evaluation of disaster preparedness education programmes.

One of the most important gaps identified concerns the considerable heterogeneity of the included studies. The reviewed literature differed substantially with regard to target populations, disaster types, educational objectives, instructional approaches and outcome measures. While this diversity reflects the complexity of disaster preparedness, it also

makes direct comparisons between studies challenging and limits the identification of educational models that can be transferred across different contexts. Similarly, Guo et al. (2025) identified the heterogeneity of disaster preparedness programmes as one of the major characteristics of the current evidence, highlighting the need to develop more standardised educational frameworks while maintaining sufficient flexibility to adapt programmes to local contexts.

A second limitation relates to the evaluation of educational outcomes. The included studies assessed a wide range of outcomes, including theoretical knowledge, disaster awareness, perceived preparedness, self-efficacy, practical skills and behavioural intentions. In many cases, these outcomes were measured using study-specific instruments that had not undergone formal validation. Such variability reduces the comparability of findings and limits the possibility of synthesising evidence across studies. A recent scoping review focusing on monitoring and evaluation in disaster management education similarly concluded that the lack of standardised outcome measures and shared evaluation frameworks remains one of the major methodological challenges in this field (Voicescu et al., 2025).

The present review also identified a limited number of methodologically robust experimental studies. Although a small number of investigations employed randomised or quasi-experimental designs, most of the available evidence consisted of cross-sectional, descriptive, or pilot studies, often involving relatively small sample sizes. Consequently, the current evidence base remains insufficient to establish causal relationships between specific educational interventions and improvements in disaster preparedness outcomes. Future research would therefore benefit from well-designed multicentre studies employing more rigorous methodological approaches.

Another important gap concerns the limited availability of medium and long-term evaluations. In most studies, programme effectiveness was assessed immediately after the educational intervention using pre- and post-test comparisons, whereas relatively few investigations examined long-term knowledge retention, sustained behavioural change, or the transfer of acquired competencies to real emergency situations. García Ulerio et al.

(2025) similarly observed that most studies evaluating simulation and immersive technologies focus primarily on immediate learning outcomes, while evidence regarding long-term competency retention and real-world preparedness remains scarce.

From a geographical perspective, the included studies were predominantly conducted in Asian countries and, to a lesser extent, in the Middle East, whereas relatively few studies originated from European settings. Considering the substantial differences in disaster risk profiles, healthcare systems, civil protection structures, educational policies and cultural contexts, this uneven geographical distribution limits the generalisability of the available evidence and highlights the need for further research across a broader range of international settings.

Finally, although recent studies demonstrate increasing interest in innovative educational approaches such as simulation, virtual reality and immersive technologies, the available evidence remains insufficient to determine which combination of educational strategies is most effective in promoting competency acquisition, long-term retention and successful transfer of learning to real emergency situations. As highlighted by both Guo et al. (2025) and García Ulerio et al. (2025), future research should prioritise the development of evidence-based educational programmes supported by standardised evaluation methods and longitudinal study designs capable of assessing sustained educational effectiveness.

Overall, the findings of the present review suggest that research on disaster preparedness education for the lay population is undergoing rapid development. However, further progress will require greater methodological standardisation, more rigorous evaluation of educational outcomes and broader representation of different geographical and sociocultural contexts. Addressing these limitations will not only strengthen the quality of future research but will also contribute to the design of more effective, sustainable and context-specific educational programmes aimed at improving disaster preparedness among the general population.

4.5. Strengths and Limitations of the Present Review

The present scoping review has several strengths. First, it provides an up-to-date synthesis of the available evidence regarding the training needs of the lay population in disaster preparedness and initial emergency response, addressing a topic of increasing relevance for public health and disaster risk management. Unlike many previous reviews, the present study did not simply describe existing educational programmes but integrated the analysis of training needs with the educational approaches adopted, providing a comprehensive overview of both the competencies considered essential and the strategies through which these competencies are developed.

A further strength lies in the adoption of a rigorous and transparent methodology. The review was conducted in accordance with the methodological guidance provided by the Joanna Briggs Institute for scoping reviews and reported following the PRISMA-ScR guidelines, ensuring a systematic process for the identification, selection, extraction and synthesis of the available evidence. Furthermore, the application of the PCC framework enabled a clear definition of the research question and eligibility criteria, contributing to the methodological consistency of the review process.

Nevertheless, this review also has several limitations. First, only studies published in English were included, which may have resulted in the exclusion of relevant evidence published in other languages. In addition, the considerable heterogeneity of the included studies with respect to target populations, disaster types, educational interventions and outcome measures prevented quantitative comparisons across studies and precluded statistical synthesis of the findings.

Another limitation derives from the nature of the scoping review methodology itself. The primary purpose of a scoping review is to map the available evidence and identify recurring themes rather than to critically appraise the methodological quality of the included studies or determine the comparative effectiveness of specific educational interventions. Consequently, the findings of the present review should be interpreted as a descriptive and conceptual synthesis of the current state of knowledge rather than as

evidence demonstrating the effectiveness of particular disaster preparedness education programmes.

Finally, the relatively small number of studies meeting the eligibility criteria, together with the uneven geographical distribution of the available evidence, suggests caution when generalising the findings to other settings. Nevertheless, the exploratory nature of this scoping review made it possible to identify the principal training needs, the educational approaches most frequently described in the literature and the major gaps that remain in current research. These findings provide a valuable foundation for guiding future research and supporting the development of evidence-informed disaster preparedness education programmes that can be adapted to different geographical contexts and the needs of the lay population.

Conclusions

The present scoping review provides an up-to-date synthesis of the available evidence regarding the training needs of the lay population in disaster preparedness and initial emergency response, addressing the research question and achieving the objectives of the study. Through the analysis of the fourteen included studies, it was possible to identify the principal competency areas considered essential in the international literature, examine the educational approaches most frequently adopted and highlight the main gaps that continue to characterise the current evidence base.

The findings indicate that disaster preparedness should be understood as a multidimensional process that extends beyond the traditional teaching of first aid alone. The competencies identified as priorities include disaster awareness and risk perception, household and community preparedness, first aid and initial emergency response skills and community resilience through active citizen engagement. Collectively, these findings suggest that effective preparedness requires the integration of theoretical knowledge, practical skills, preventive behaviours and active participation within communities.

The review also highlights a progressive evolution in the educational methodologies adopted within disaster preparedness programmes. The increasing use of simulation, virtual reality, practical exercises and participatory learning approaches reflects a broader shift towards competency-based education, with educational interventions increasingly designed to develop transferable skills that can be effectively applied in real emergency and disaster situations rather than simply promoting theoretical knowledge acquisition.

At the same time, several important limitations within the current literature were identified. The considerable methodological heterogeneity of the included studies, the limited standardisation of evaluation instruments, the scarcity of longitudinal research and the underrepresentation of different geographical contexts highlight the need for more robust methodological approaches capable of assessing not only the immediate effectiveness of educational interventions but also long-term competency retention and their actual impact on community preparedness.

Overall, the findings of this review suggest that education of the lay population represents a fundamental component of disaster risk reduction and health emergency preparedness strategies. The development of evidence-informed educational programmes, designed on the basis of the training needs identified in the literature and supported by active and contextualised educational methodologies, has the potential to strengthen individual and community preparedness, enhance community resilience and support the capacity of health systems and civil protection organisations to respond effectively to emergencies.

The evidence synthesised in this review provides a valuable reference for researchers, healthcare professionals, educators and policy makers involved in the planning and implementation of disaster preparedness education programmes for the lay population. By identifying the principal training needs, the most promising educational approaches and the main gaps in current knowledge, this review offers an evidence-informed foundation for the future development of structured educational programmes that can be adapted to different geographical settings and to the specific needs of individual communities.

In an era characterised by increasingly complex natural, technological and public health threats, investing in disaster preparedness education for the general population means investing in the capacity of communities to anticipate, respond to and recover from emergencies in a more informed, coordinated and resilient manner. From this perspective, disaster preparedness education should be regarded not merely as a means of transferring knowledge, but as a strategic component of public health capable of strengthening community resilience and contributing to more effective disaster risk reduction.

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Appendices

The following appendices provide supplementary methodological material supporting the study selection, data extraction, thematic analysis and synthesis of the evidence included in this scoping review.

Appendix A: Screening Table of Retrieved Studies

This appendix presents the complete screening table of the 83 records identified after applying the predefined search strategy and time filter. Each study was systematically assessed according to the predefined inclusion and exclusion criteria and the screening decision and reason for exclusion (where applicable) are reported to enhance the transparency and reproducibility of the review process.

Titolo	Autore	Anno	PMID/LINK	INCLUDED/EXCLUDED	Motivo esclusione	Panoramica	Excluded - Per Prisma
First aid training in conflict zones: An interventional training study and a post-training knowledge assessment.	Jafar, K., Janoud, R., Sheikh Sobeh, A., Al-Deeb, R., & Janoud, O.	2026	https://doi.org/10.1177/20563121261449059	INCLUDED	-	Interventional study on first aid training in conflict zones; evaluates post-training knowledge among lay population.	
Establishment of Rapid Response Teams for Emergencies in the Kingdom of Saudi Arabia: Cross-sectional Qualitative Study	Adawi, A., et al	(2026)	https://doi.org/10.1017/dmp.2026.10354	EXCLUDED	Focus on emergency response teams/professionals rather than lay population training.	Study related to emergency management structures and rapid response teams in Saudi Arabia.	Studies not involving the general population
National Public Health Institutes in Africa, 2010-2025: pathways, governance, and outcomes, a scoping review.	Nyika, H., Tiluham, T., & Mugauri, H.	(2026)	https://doi.org/10.1186/s12913-026-14473-2	EXCLUDED	Focus on public health institutes/governance rather than lay population training	Scoping review focused on governance and outcomes of National Public Health Institutes in Africa.	Studies not related to training or preparedness
The Effect of Awareness-Based Disaster Education on Women's Disaster Awareness and Preparedness: A Randomized Controlled Study.	Söğüt, S. C., & Kiliçarslan, T.	(2026)	https://doi.org/10.1111/phn.70103	INCLUDED	-	Randomized controlled study evaluating disaster education and preparedness among women.	
Evaluation of awareness, attitudes, and practices towards disaster preparedness among Saudi healthcare professionals: implications for enhancing emergency response and training.	Thirunavukarasu, A., Alsaied, A. A., Alhafaee, S. T., Abdel-Salam, D. M., Alhafaee, N. T., Alanazi, M. A., Almughamsi, R. M., Alkawabi, D. K., & Al-Zahrany, W.	(2025)	https://doi.org/10.7717/peerj.20364	EXCLUDED	Study focused exclusively on healthcare professionals	Cross-sectional study on disaster preparedness among Saudi healthcare professionals; not involving lay/general population	Articles focusing only on healthcare professionals
Establishment of Subnational Public Health Emergency Operation Centers During the COVID-19 Pandemic, Kenya, 2020-2023.	Galgalo, T., Wako, D., Hines, J. Z., Nzioka, E., Aden, M., Kigiro, J., Mwatha, S., Ogiutu, J., Macharia, D., Nyamongo, J., Omondi, K., Sandhu, K., Marble, E., Abade, A., Kimenyi, M. K., Limo, H., & Herman-Roloff, A.	(2025)	https://doi.org/10.1177/23265094251398495	EXCLUDED	Study not focused on lay population training or preparedness interventions	Study focused on establishment and management of Public Health Emergency Operation Centers (PHEOCs) and institutional emergency coordination during COVID-19	Studies not related to training or preparedness
Building Resilient Communities: A Participatory Approach to Flood Disaster Preparedness in Thailand.	Thronsoo, M., Chaiyaporn, K., Thronsoo, C., Sripol, C., Chanthamath, S., & Wongkondach, R.	(2026)	https://doi.org/10.1097/PHH.00000000000002298	INCLUDED	-	Participatory community-based disaster preparedness intervention focused on flood preparedness among local communities in Thailand	
Applications of Artificial Intelligence in the Control of Infectious Diseases in the Post-COVID Era: Scoping Review.	Kim, C., Austin, R., Wurtz, R., Delaney, C. W., & Rajamani, S.	(2025)	https://doi.org/10.2196/84242	EXCLUDED	Study not related to training or preparedness of the lay population	Scoping review focused on artificial intelligence applications for infectious disease control in the post-COVID era; no lay population educational interventions or preparedness training	Studies not related to training or preparedness

Titolo	Autore	Anno	PMID/LINK	INCLUDED/EXCLUDED	Motivo esclusione	Panoramica	Excluded - Per Prisma
Strengthening the mpox response: how do we balance pragmatism and equity in resource-constrained settings?	Lokossou, V. K., Ogunyemi, K. O., Usman, A. B., Kamdem, S., Aharharanzo, C. D., Agbla, F., Aissi, M. A., & Sombi, L.	(2025)	https://doi.org/10.7189/jogh.15.03026	EXCLUDED	Article not focused on training interventions or preparedness of the lay population	Article discussing equity and public health response strategies for mpox in resource constrained settings; not focused on community training programmes	Studies not related to training or preparedness
Disaster Preparedness Training Relevance for Organizational Response Effectiveness: A Healthcare Executive Perspective.	Hertelendy, A. J., Richmond, J. G., Lassar, W. M., Mitchell, C. L., Mayo, M. A., Vilander, S., Devereaux, A., Burkli, F. M., & Ullmann, S.	(2026)	https://doi.org/10.1097/JHM-D-24-00162	EXCLUDED	Study focused on healthcare executives and organizational preparedness rather than lay population	Study exploring disaster preparedness training from the perspective of healthcare executives and organizational response effectiveness	Articles focusing exclusively on clinical or hospital-based emergency management
A practice-oriented framework for basic life support training of Brazilian school teachers: integrating Law 13,722/2018, andragogy, and the health belief model.	Carvalho Castanha, C. S., Guerrero Dabon, B. E., Zangrolami-Raimundo, J., Barbosa Tavares, L. F., de Abreu, L. C., & Raimundo, R. D.	(2025)	https://doi.org/10.3389/fpubh.2025.1616452	INCLUDED	-	Study focused on basic life support training framework for school teachers as lay responders in emergency situations	
Epidemiological and clinical characteristics of seawater drowning cases in Sinop, a Turkish coastal city: a 13-year retrospective study.	Ergen, T., Öncü, K., Özcan, Ö., Kara, Ş. Ş., Sağlam, M., Öhnu, E., Sağlam, D. Ö., & Cabar, H. D.	(2025)	https://doi.org/10.1186/s12873-025-01365-y	EXCLUDED	Study focused on clinical and epidemiological characteristics, not on training or preparedness interventions	Retrospective clinical study analysing seawater drowning cases over 13 years in a Turkish coastal city	Articles focusing exclusively on clinical or hospital-based emergency management
Preparing pharmacists for disaster management and practice: A participatory scoping review.	Lydon, E., Scallih, S., Arakawa, N., Cox, A. R., Schneider, C. R., & Hanning, S. M.	(2026)	https://doi.org/10.1016/j.cpr.2025.102492	EXCLUDED	Study focused on pharmacists and healthcare professionals	Participatory scoping review on disaster management education and preparedness for pharmacists	Articles focusing only on healthcare professionals
Factors influencing the public health emergency preparedness among Generation Z nursing interns in the post-pandemic era: a cross-sectional study.	Duan, C., Feng, G., Zhuang, X., Zhou, Y., Jia, Y., Sun, X., & Zhang, Y. P.	(2025)	https://doi.org/10.3389/fpubh.2025.1632602	EXCLUDED	Study focused on nursing interns/healthcare trainees	Cross-sectional study analysing emergency preparedness among Generation Z nursing interns in the post-pandemic era	Articles focusing only on healthcare professionals
Community volunteer participation and its determinants during respiratory infectious disease outbreaks in China: A cross-sectional study across multiple provinces.	Jin, H., Ding, X., Li, Z., Cao, J., Sun, X., Ji, Y., & Ning, F.	(2025)	https://doi.org/10.1371/journal.pone.0330838	INCLUDED	-	Study exploring determinants of community volunteer participation during infectious disease outbreaks among general population/community volunteers	
The Impact of Misinformation on Social Media in the Context of Natural Disasters: Narrative Review.	Hilberts, S., Govers, M., Petelos, E., & Evers, S.	(2025)	https://doi.org/10.2196/70413	EXCLUDED	Study not focused on training interventions or preparedness competencies of the lay population	Narrative review analysing the impact of misinformation on social media during natural disasters	Studies not related to training or preparedness
Sudden Cardiac Arrest and Death in Sports: An Updated Overview of Epidemiology, Etiologies, and Prevention Strategies, with Emphasis on Inherited Cardiomyopathies.	Beffagna, G., Sanchis-Gomar, F., Ribichini, F., & Lippi, G.	(2025)	https://doi.org/10.1055/a-2664-0950	EXCLUDED	Clinical review not related to disaster preparedness training or lay population education	Review focused on epidemiology, causes, and prevention strategies related to sudden cardiac arrest in sports	Studies not related to training or preparedness

Título	Autores	Año	PMID/LINK	INCLUIDO/EXCLUIDO	Motivo exclusión	Panorámica	Excluido - Per Prisma
Disaster Preparedness and Response Among Healthcare Professionals During the Hajj: A Systematic Literature Review.	Alrabie, T., Brown, M., Rice, B., & Marsh, L.	(2025).	https://doi.org/10.3390/healthcare13111571	EXCLUDED	Study focused exclusively on healthcare professionals	Systematic review examining disaster preparedness and response among healthcare professionals during the Hajj pilgrimage	Articles focusing only on healthcare professionals
Enhancing Emergency Preparedness: A Call to Incorporate Postexposure Prophylaxis in Mass Casualty Protocols.	Edward, M., Hellar, A., Oyeaghalu, C., & Ogunfolaj, O.	(2025).	https://doi.org/10.1002/hst2.70973	EXCLUDED	Article focused on clinical/emergency management protocols rather than lay population training	Article discussing incorporation of postexposure prophylaxis into mass casualty preparedness protocols	Articles focusing exclusively on clinical or hospital-based emergency management
Public Health Emergency Preparedness and Response Workforce Competencies: Developing and Supporting the Next Generation of Practitioners.	Moore, A., Errett, N. A., & Patel, R.	(2025).	https://doi.org/10.1017/dmp.2025.10068	EXCLUDED	Study focused on public health workforce/practitioners rather than lay population	Article discussing competencies and preparedness training for public health emergency preparedness workforce	Articles focusing only on healthcare professionals
Teaching Methodologies for First Aid in Physical Education in Secondary Schools: A Systematic Review.	Parade-Espinosa, J. M., Ortega-Gómez, S., Ruiz-Muñoz, M., & González-Silva, J.	(2025).	https://doi.org/10.3390/healthcare13101112	INCLUDED	-	Systematic review focused on first aid educational methodologies in secondary school physical education	
Medical preparedness for bioterrorism and chemical warfare: A public health integration review.	Ugwu, C. N., Ugwu, O. P., Alum, E. U., Eze, V. H. U., Basajja, M., Ugwu, J. N., Ogenyi, F. C., Ejemot-Nwadiaro, R. I., Okon, M. B., Egbu, S. I., & Uhl, D. E.	(2025).	https://doi.org/10.1097/MD.0000000000004228	EXCLUDED	Review focused on medical/public health preparedness rather than lay population training	Review addressing medical preparedness and public health integration in bioterrorism and chemical warfare scenarios	Studies not involving the general population
Drinking water supply for communities affected by natural disaster emergencies: a qualitative study	Gandeshmin, S. B., Seyedin, S. H., & Dowlati, M.	(2025).	https://doi.org/10.1186/s12873-025-01225-9	EXCLUDED	Study not focused on training interventions or preparedness competencies	Qualitative study exploring drinking water supply management for communities affected by natural disasters	Studies not related to training or preparedness
The regional training centre for the emergency medical teams initiative in the WHO African region: a review of the development and progress over the past 4 years.	Oyugi, B., Martínez-Monterrey, L. G., Ayalew, L., Okeibunor, J. C., Mbasha, J. J., Kamara, R., Relan, P., Tadelle, N., Gebreyesus, A., Zeynu, N., Salio, F., Balde, T., Braka, F., & Gueye, A. S.	(2025).	https://doi.org/10.3389/pubh.2025.154261	EXCLUDED	Study focused on emergency medical teams and professional training	Review of the WHO African regional training centre for Emergency Medical Teams (EMTs) Initiative	Articles focusing only on healthcare professionals
Adapting WHO Rapid Response Teams Advanced Training Program to Saudi Arabia's Public Health Needs: A Systematic Process.	Alahmari, A., Tabche, C., Adawi, A., Alanazi, S., Alfalah, L., Aljumah, M., Alkhatiri, H., Atwan, Z., Shami, S., Sulaimani, G., Rawaf, S., & Alkhorai, A.	(2025).	https://doi.org/10.1017/dmp.2025.27	EXCLUDED	Study focused on Rapid Response Teams and professional public health training	Study describing adaptation of WHO Rapid Response Teams (RRT) advanced training programme to Saudi Arabia	Articles focusing only on healthcare professionals
Knowledge and Awareness About the Basics of Cardiopulmonary Resuscitation in the Saudi Population.	Alahmari, S., Alahmari, A. H., Aldosari, M., Aldawsari, H. A., & Almass, A.	(2025).	https://doi.org/10.7759/coursu.77350	INCLUDED	-	Study assessing CPR knowledge and awareness among the Saudi general population	

Título	Autores	Año	PMID/LINK	INCLUIDO/EXCLUIDO	Motivo exclusión	Panorámica	Excluido - Per Prisma
Scoping Review of Virtual Reality (VR) Based Disaster Mitigation Education.	Kimura, R., Fukushima, A., Kajiwara, K., Sakuramoto, H., Yoshihara, S., Harada, K., Nakayama, T., & Ito, A.	(2024).	https://doi.org/10.7759/coursu.74052	INCLUDED	-	Scoping review analysing the use of virtual reality for disaster mitigation education and preparedness training	
Competence and Training Needs in Infectious Disease Emergency Response Among Chinese Nurses: Cross-Sectional Study.	Zhang, D., Chen, Y. J., Cui, T., Zhang, J., Chen, S. Y., & Zhang, Y. P.	(2024).	https://doi.org/10.2196/e2887	EXCLUDED	Focuses exclusively on healthcare professionals (nurses) and does not involve the lay population.	Cross-sectional study assessing infectious disease emergency response competencies and training needs among Chinese nurses. The study aims to identify competency gaps and training priorities for healthcare professionals in emergency preparedness.	Full text not available
ARCHWay: an innovative educational program advancing the public health workforce.	Swan, B. A., Phan, Q., Crawford, K., Febres-Cordero, S., Kaligotia, L., Chicas, R., Giordano, N. A., Brasher, S., Chance-Revels, R., Spaulding, A., & Steiger, L.	(2024).	https://doi.org/10.1186/s13690-024-01422-1	EXCLUDED	Focuses on training of Community Health Workers (public health workforce) rather than lay populations.	Describes the ARCHWay educational program, a 12-week training curriculum designed to prepare Community Health Workers (CHWs) through modules on health promotion, emergency preparedness, mental health first aid, community outreach, and field placements. The primary aim is workforce development and strengthening the public health workforce.	Articles focusing only on healthcare professionals
Emergency preparedness in the central sterile supply department: a multicenter cross-sectional survey.	Liu, J., Gui, F., Zhang, M., & Chen, H.	(2024).	https://doi.org/10.1186/s12873-024-01053-3	EXCLUDED	Study focuses on emergency preparedness among nurses working in hospital Central Sterile Supply Departments (CSSDs), not on lay populations.	Multicenter cross-sectional survey conducted in China assessing emergency drills, preparedness capacity, attitudes, and emergency response competencies among CSSD nurses. The study aims to evaluate preparedness within a hospital department and identify factors associated with emergency response capacity.	Articles focusing only on healthcare professionals
The emergency medical teams initiative in the WHO African region: a review of the development and progress over the past 7 years.	Balde, T., Oyugi, B., Mbasha, J. J., Kamara, R., Martínez-Monterrey, L. G., Relan, P., Lapiro, C., Bompangue, D., Fortin, A., Okeibunor, J., Salio, F., Braka, F., Chamia, D., Gueye, A. S., Yao, N. K. M., & Fall, I. S.	(2024).	https://doi.org/10.3389/pubh.2024.1387034	EXCLUDED	Focuses on Emergency Medical Teams (EMTs) and health emergency workforce capacity-building rather than disaster preparedness training for lay populations.	Review describing the implementation and development of the WHO Emergency Medical Teams (EMT) initiative across the African Region. It discusses workforce development, training activities, accreditation processes, deployment readiness, and strengthening emergency response capacity among professional emergency response teams.	Articles focusing only on healthcare professionals

Titolo	Autore	Anno	PMID/LINK	INCLUID/EXCLUDED	Motivo esclusione	Panoramics	Excluded - Per Prisma
An Overview of Appropriate Medical Practice and Preparedness in Radiation Emergency Response.	Al-Ibraheem, A., Moghrabi, S., Abdikadir, A., Safi, H., Kazi, Z., Al-Balaloshi, B., Salman, K., Khalaf, A., Zeh, M., Al Neemi, H., Aldousari, H., Mula-Hussain, L., Juwaid, M., Hatazawa, J., Hawawri, F., & Mansour, A.	(2024).	https://doi.org/10.7759/cureus.61627	EXCLUDED	Review article focused primarily on radiation emergency management, medical practice, first responders, and healthcare personnel preparedness rather than evaluating disaster preparedness training programs for lay populations.	Narrative review describing radiation emergencies, acute radiation syndrome management, emergency response systems, roles of healthcare providers and first responders, preparedness planning, and educational needs in radiation emergency response. Although the paper mentions the importance of education and training for both medical personnel and the public, it does not evaluate or analyze a specific training intervention targeting lay populations.	Studies not related to training or preparedness
Earthquakes, Hurricanes, Pandemics: Pharmacy Students Impacting Pharmacy Practice in Puerto Rico Through Medication Therapy Management Services During Disasters.	Arce, L., Hale, G., Khanfar, N., Pérez Ayala, N., Aponte Torres, G., & Acosta Medina, H.	(2024).	https://doi.org/10.1017/dmp.2024.24	EXCLUDED	Study focused on pharmacy students and professional healthcare training rather than lay population.	Survey evaluating pharmacy students' perceptions of a Medication Therapy Management training experience during disasters in Puerto Rico.	Articles focusing only on healthcare professionals
Disaster response readiness assessment of public hospitals in Addis Ababa City, Addis Ababa, Ethiopia.	Frissa, Y. B., Sultan, M., Abdelrahman, M., & Kifle Belachew, F.	(2023).	https://doi.org/10.1016/j.afjem.2023.06.004	EXCLUDED	Focused on hospital disaster preparedness and healthcare system readiness rather than training interventions for the lay population.	Cross-sectional assessment of disaster readiness, emergency plans, infrastructure, resources, and staff preparedness in public hospitals in Addis Ababa	Articles focusing only on healthcare professionals
Preparedness of the community in facing disasters like earthquakes (Case: Cisarua, Indonesia).	Pamungkas, T. D., Alyas, S. A., Nurfalah, I., Ningrum, E., & Maryani, E.	(2023).	https://doi.org/10.4102/jamba.v15i1.1438	INCLUDED	-	Cross-sectional study assessing earthquake preparedness among community members in Cisarua District, Indonesia, identifying gaps in knowledge, emergency planning, warning systems, and resource mobilization.	
Psychological disturbances encountered by the healthcare professionals, military professionals and general public in Sri Lanka during COVID-19 pandemic: a cross-sectional study.	Sundarapperuma, T. D., Gamage, M. W. K., Rathnayake, N., Weeraratna, E. B., & Jagodage, H. M. H.	(2023).	https://doi.org/10.1186/s12888-023-04918-2	EXCLUDED	Study focused on psychological impact of COVID-19 rather than disaster preparedness training or educational interventions.	Cross-sectional study assessing anxiety, depression, stress, and psychological disturbances among healthcare workers, military personnel, and the general public during the COVID-19 pandemic.	Studies not related to training or preparedness
Constructing an emergency preparedness evaluation index system for public use during major emerging infectious disease outbreaks: a Delphi study.	Wei, W., Liu, Y., Zhou, N., Tian, M., Xie, L., Watson, R., Dai, F., Chen, Y., & Hu, W.	(2023).	https://doi.org/10.1186/s12888-023-15980-4	INCLUDED	-	Delphi study developing and validating an evaluation index system to assess public emergency preparedness during emerging infectious disease outbreaks.	
Public health and medical preparedness for mass casualties from the deliberate release of synthetic opioids.	Cibulsky, S. M., Wille, T., Funk, R., Sokolowski, D., Gagnon, C., Lafontaine, M., Brevett, C., Jabbour, R., Cox, J., Russell, D. R., Jett, D. A., Thomas, J. D., & Nelson, L. S.	(2023).	https://doi.org/10.3389/fpubh.2023.1158479	EXCLUDED	Focused on public health and medical system preparedness for mass casualty incidents rather than training interventions for the lay population	Review discussing preparedness strategies, response planning, and medical countermeasures for mass casualties resulting from synthetic opioid exposure.	Articles focusing only on healthcare professionals

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Medical Reserve Corps Volunteers' Characteristics Affect Disaster Survival.	Brannen, D. E., Howell, M., Ridgare, C. M., & Shuster, J. L.	(2023).	https://doi.org/10.1017/dmp.2023.60	EXCLUDED	Focus on trained disaster volunteers and disaster response performance rather than disaster preparedness training needs assessment in healthcare professionals or the general population.	Study evaluated how characteristics and training of Medical Reserve Corps volunteers affected victim survival in disaster simulations. Results showed that Stop-the-Bleed and psychological first aid training improved outcomes, while volunteer attitudes, education level, and trust in public authorities also influenced performance.	Studies not involving the general population
Bridging the gap, how interprofessional collaboration can support emergency preparedness for children with disabilities and their families: an exploratory qualitative study.	Flanagan, S. K., Sternan, J. J., Merighi, J. R., & Batt, R.	(2023).	https://doi.org/10.1186/s12889-023-15580-4	EXCLUDED	The study focuses on professionals involved in emergency preparedness planning for children with disabilities rather than assessing training needs of the general population.	Qualitative study exploring how interprofessional collaboration can improve emergency preparedness for children with disabilities and their families. The findings emphasize coordination among healthcare, education, emergency management, and community professionals rather than community-level preparedness training needs.	Articles focusing only on healthcare professionals
COVID-19 Vaccine Administration: Phase 2 of an in Progress Review in New York State Local Health Departments.	Bloomstone, S., Fleming, M., Acana, M., D'Angelo, E., Ravenhall, S., & Murman, M.	(2022).	https://doi.org/10.3390/jerph19031939	EXCLUDED	Focused on public health workforce response and vaccine administration during COVID-19 rather than disaster preparedness training for community members	Study evaluating COVID-19 vaccine administration efforts by New York State Local Health Departments, focusing on workforce capacity, operational challenges, and public health emergency response during the pandemic.	Articles focusing only on healthcare professionals
Public health nurses' perceptions and experiences of emergency preparedness, responsiveness, and burnout during the COVID-19 pandemic.	Owon, S. H., Thonggratwan, V., Kett, P., & Cho, Y.	(2023).	https://doi.org/10.1111/jahn.13141	EXCLUDED	Focused on healthcare professionals' experiences, preparedness, response activities, and burnout during COVID-19 rather than disaster preparedness education or training interventions for the target population of the review.	Qualitative study involving public health nurses in Wisconsin exploring perceptions of emergency preparedness, pandemic response activities, organizational challenges, and burnout during COVID-19. Findings highlighted workforce preparedness issues, response experiences, and the need for organizational support and training.	Articles focusing only on healthcare professionals
A Radiological Emergency Health and Safety Plan for City Agencies Without First Response Responsibilities.	Maiello, M. L., & Duarte, M.	(2022).	https://doi.org/10.1089/hs.2021.0194	EXCLUDED	Focused on radiological emergency planning and safety protocols for municipal agencies rather than preparedness training interventions for the general population.	Article describing the development of a radiological emergency health and safety plan for city agencies without direct emergency response responsibilities, aiming to improve organizational preparedness and worker safety during radiological incidents.	Studies not involving the general population

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Public health response and medical management of internal contamination in past radiological or nuclear incidents: A narrative review.	Li, C., Alves Dos Reis, A., Ansari, A., Bertelli, L., Carr, Z., Dainiak, N., Degteva, M., Efremov, A., Kalnich, J., Kryuchkov, V., Kulkh, B., Kurthara, O., Antonio Lopez, M., Port, M., Riddell, T., Rump, A., Sun, Q., Tuo, F., Youngman, M., & Zhang, J.	(2022).	https://doi.org/10.1016/j.envint.2022.107222	EXCLUDED	Narrative review focused on public health response and medical management of radiological/nuclear incidents, without evaluating preparedness training interventions for the general population.	Narrative review summarizing public health responses, medical countermeasures, and management strategies for internal contamination following past radiological and nuclear incidents.	Editorials, commentaries, opinion papers, or narrative reviews
Design of a Virtual Reality Interactive Training System for Public Health Emergency Preparedness for Major Emerging Infectious Diseases: Theory and Framework.	Luo, Y., Li, M., Tang, J., Ren, J., Zheng, Y., Yu, X., Jiang, L., Fan, D., & Chen, Y.	(2021).	https://doi.org/10.2196/23956	INCLUDED	-	Study describing the development of a Virtual Reality Interactive Training System (VRITS) designed to enhance public health emergency preparedness for major emerging infectious diseases. The framework targets the general population and aims to improve preparedness knowledge, attitudes, and behaviors through immersive, scenario-based training.	
State of public health emergency response leadership training: A multitermed organizational perspective.	Salerno, A., Li, Y., Davis, X. M., Stennies, G., Barnett, D. J., Fisher, M. K., Biesiadecki, L., Dekker, D., Pham, N., Pearson, J. L., Podgornik, M. N., Hunter, D. W., Vagi, S., & Hsu, E. B.	(2021).	https://doi.org/10.5055/ajdm.2021.0399	EXCLUDED	Focus on leadership training and workforce development among public health emergency response professionals rather than preparedness training for the general population.	Study assessing the status of public health emergency response leadership training across different organizational levels, identifying gaps and opportunities for workforce development in emergency management and public health leadership.	Articles focusing only on healthcare professionals
Effect of virtual reality simulation training on the response capability of public health emergency reserve nurses in China: a quasisexperimental study.	Zhang, D., Liao, H., Jia, Y., Yang, W., Ho, P., Wang, D., Chen, Y., Yang, W., & Zhang, Y. P.	(2021).	https://doi.org/10.1136/bmjopen-2021-046611	EXCLUDED	Evaluates a virtual reality training program for emergency reserve nurses rather than preparedness training for the general population.	Quasi-experimental study assessing the effectiveness of virtual reality simulation training in improving emergency response competencies, preparedness knowledge, and practical skills among public health emergency reserve nurses in China.	Articles focusing only on healthcare professionals
Preparing for and responding to sexual and reproductive health in disaster settings: evidence from Fiji and Tonga.	Beek, K., Drysdale, R., Kusen, M., & Dawson, A.	(2021).	https://doi.org/10.1186/s12978-021-01236-2	EXCLUDED	Focuses on health system preparedness and sexual and reproductive health service delivery in disaster settings rather than educational interventions for public emergency preparedness.	Qualitative study exploring preparedness and response strategies for sexual and reproductive health services during disasters in Fiji and Tonga, identifying challenges, lessons learned, and recommendations for strengthening health system resilience.	Studies not related to training or preparedness

Titolo	Autore	Anno	PMID/LINK	INCLUIDED/EXCLUDED	Motivo esclusione	Panoramica	Excluded - Per Prisma
Developing an instrument to measure household preparedness using the Community Assessment for Public Health Emergency Response (CASPER) methodology: An evidence-informed approach.	Ferguson, R. W., Barnett, D. J., Kennedy, R. D., Sell, T. K., Wiedler, S. S., Spannhaake, E. W.	(2021).	https://doi.org/10.5055/jem.0583	EXCLUDED	The study develops a household preparedness assessment instrument but does not analyse training interventions, educational programmes, competencies, or training needs.	Methodological study describing the development of a survey instrument to assess household radiological emergency preparedness using the CASPER methodology.	Studies not related to training or preparedness
Participation in emergency preparedness and response: a national survey of pharmacists and pharmacist extenders.	Zhao, Y., Diggs, K., Hu, D., Fish, H., Beckner, J. C., & Westrick, S. C.	(2021).	https://doi.org/10.1016/j.japh.2021.05.011	EXCLUDED	Survey focused on pharmacists and pharmacy support personnel involved in emergency preparedness and response activities.	National survey examining the participation, experiences, and roles of pharmacists and pharmacist extenders in emergency preparedness and public health response activities in the United States.	Articles focusing only on healthcare professionals
Simulated Patient Environment: A Training Tool for Healthcare Professionals in COVID-19 Era.	V Babu, M., Anumugam, M. K., & Debnath, D. J.	(2021).	https://doi.org/10.2147/AMEPS297536	EXCLUDED	Training intervention exclusively involving healthcare professionals.	Quasi-experimental study evaluating an in-situ simulation training program for COVID-19 outbreak management among doctors, nurses and other healthcare workers. The intervention significantly improved preparedness and response scores after training.	Articles focusing only on healthcare professionals
Factors Associated With Individual Emergency Preparedness Behaviors: A Cross-Sectional Survey Among the Public in Three Chinese Provinces.	Ning, N., Hu, M., Qiao, J., Liu, C., Zhao, X., Xu, W., Xu, W., Zheng, B., Chen, Z., Yu, Y., Hao, Y., & Wu, Q.	(2021).	https://doi.org/10.3389/fpubh.2021.644421	INCLUDED	-	Cross-sectional survey among 2,506 members of the Chinese public examining factors associated with emergency preparedness behaviors. Training and emergency exercises were identified as significant contributors to preparedness, together with attitudes, self-efficacy and risk perception.	
Public Health Emergency Response Leadership Training: A Qualitative Assessment of Existing Educational Opportunities and Perceived Facilitators, Barriers, and Priorities in Professional Development.	Li, Y., Hsu, E. B., Davis, X. M., Stennies, G. M., Pham, N. N., Fisher, M. C., Pearson, J. L., Barnett, D. J., Trigos, S. M., Podgornik, M. N., Hunter, D. W., & Vagi, S. J.	(2022).	https://doi.org/10.1097/PHH.00000000000001321	EXCLUDED	Focus on leadership training for public health professionals rather than the general population.	Qualitative study assessing existing public health emergency response leadership training opportunities, barriers, facilitators and professional development needs among public health leaders and emergency response professionals.	Articles focusing only on healthcare professionals
Operationalizing Pandemic Vaccinations at a Regional Supermarket Chain.	Gessler, C. A., Richardson, R. M., Hall, D. L., & Coley, K. C.	(2022).	https://doi.org/10.1017/dmp.2021.43	EXCLUDED	Focuses on pharmacy pandemic vaccination planning and workforce preparedness rather than training or preparedness of the general population.	Descriptive study summarizing a strategic planning initiative involving pharmacy leaders, public health authorities and academic experts to develop operational strategies for pandemic vaccination delivery in community pharmacies. Topics included staffing, workflow, vaccine-specific training, logistics and emergency response planning.	Articles focusing only on healthcare professionals

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MOSQUITO CONTROL EMERGENCY PREPAREDNESS AND RESPONSE TO NATURAL DISASTERS. J	Connelly, C. R., & Borchert, J.	(2020).	https://doi.org/10.2987/8756-971X.36.2S.2	EXCLUDED	Focused on mosquito control programs and public health agencies rather than training or preparedness of the general population.	Introductory article for a special issue describing preparedness, response, recovery and mosquito-control activities following natural disasters, with emphasis on operational guidance, funding, training of mosquito-control personnel and public health agencies.	Studies not related to training or preparedness
Validation of the Disaster Preparedness Evaluation Tool for Nurses-The Korean Version.	Han, S. J., & Chun, J.	(2021).	https://doi.org/10.3390/jerph18031348	EXCLUDED	Validation study involving nurses only and not the general population.	Psychometric study conducted on 497 Korean nurses to validate the Korean version of the Disaster Preparedness Evaluation Tool (DPET-K), assessing disaster knowledge, training, response and evaluation competencies.	Studies not involving the general population
A CLIMATE: A Tool for Assessment of Climate-Change-Related Health Consequences in the Emergency Department.	Nicholas, P. K., Breakley, S., McKeown, S., Eddy, E. Z., Fanuele, J., & Starodub, R.	(2021).	https://doi.org/10.1016/j.jen.2020.10.002	EXCLUDED	Focused on a clinical assessment tool for emergency healthcare professionals and hospital settings rather than training or preparedness of the general population.	Study describing the development and validation of the CLIMATE assessment tool, designed to support emergency department professionals in identifying health consequences associated with climate change and environmental exposures.	Articles focusing exclusively on clinical or hospital-based emergency management
Early policy actions and emergency response to the COVID-19 pandemic in Mongolia: experiences and challenges.	Erkhembayer, R., Dickinson, E., Badarch, D., Narula, I., Warburton, D., Thomas, G. N., Ochir, C., & Manaseki-Holland, S.	(2020).	https://doi.org/10.1016/S2214-	EXCLUDED	Study focused on national COVID-19 policy actions and emergency response rather than training or preparedness interventions for the general population.	Descriptive analysis of Mongolia's early governmental response to COVID-19, including border controls, surveillance measures, risk communication strategies, quarantine policies and public health interventions.	Studies not related to training or preparedness
Applying the Ready, Willing, and Able Framework to Assess Agency Public Health Emergency Preparedness: The CDC Perspective.	Chiang, S. C., Fisher, H. H., Bridwell, M. E., Triggono, S. M., Rasulna, B. B., & Kuwabara, S. A.	(2020).	https://doi.org/10.1089/hs.2019.0090	EXCLUDED	Focused on public health agency workforce preparedness and organizational emergency response capacity rather than training or preparedness of the general population.	Study applying the Ready, Willing, and Able framework to assess public health emergency preparedness within governmental public health agencies, examining workforce capacity, willingness to respond, and organizational readiness.	Articles focusing only on healthcare professionals
Enhancing Access to Quality Online Training to Strengthen Public Health Preparedness and Response.	Wood, S. J., Rogers, M. H., Frost, M. C., Revere, D., Rose, B. A., & D'Ambrosio, L.	(2019).	https://doi.org/10.1097/PHH.00000000000000811	EXCLUDED	Online preparedness training developed for public health and emergency preparedness professionals rather than the general population.	Study describing the development and dissemination of online training resources to improve emergency preparedness and response competencies among the public health workforce through distance-learning approaches.	Articles focusing only on healthcare professionals
Research Ethics Committees (RECs) and epidemic response in low and middle income countries.	Bain, L. E., Ngwain, C. G., Nwobogahay, J., Sumbob, J. G., Ndianchou, R., & Awah, P. K.	(2018).	https://doi.org/10.11604/pami.2018.31.209.17026	EXCLUDED	Study focused on ethical and regulatory aspects of epidemic response rather than training or preparedness interventions for the general population.	Review discussing the role, challenges and preparedness of Research Ethics Committees in supporting epidemic research and emergency response activities in low- and middle-income countries.	Studies not related to training or preparedness

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A Cross-Sectional Study on China's Public Health Emergency Personnel's Field Coping-Capacity Need, Influencing Factors, and Improvement Options.	Zhao, M., Liu, B., Wang, L., Wu, Q., Kang, Z., Hao, Y., Amporfo, D., & Gao, L.	(2020).	https://doi.org/10.1017/dmp.2019.32	EXCLUDED	Study focused on public health emergency personnel rather than the general population.	Cross-sectional survey assessing field coping capacity, training needs, influencing factors and improvement strategies among Chinese public health emergency response personnel.	Articles focusing only on healthcare professionals
Emergency Response Training in California: Piloting the Environmental Health Training in Emergency Response Operations Course in a Local Environmental Health Department.	Barnett, M., Zaidel, B., & Kalis, M. A.	(2018).	Journal of environmental health, 81(5), 36-37.	EXCLUDED	Training program designed for environmental health professionals rather than the general population.	Brief report describing the pilot implementation of the Environmental Health Training in Emergency Response Operations (EHTER) course within a local environmental health department in California to improve emergency response competencies among environmental health personnel.	Articles focusing only on healthcare professionals
Building Simulation Exercise Capacity in Latin America to Manage Public Health Emergencies.	Hanson, K., Hernandez, L., & Banaski, J. A., Jr	(2018).	https://doi.org/10.1089/hs.2018.0091	EXCLUDED	Simulation-based training aimed at public health and emergency management professionals rather than the general population.	Descriptive study reporting a capacity-building initiative in Latin America focused on developing simulation exercise capabilities for public health emergency preparedness and response among governmental and public health personnel.	Articles focusing only on healthcare professionals
The South Dakota Model: Health Care Professions Student Disaster Preparedness and Deployment Training.	Owens, M. P., Buffington, C., Frost, M. P., & Waldner, R. J.	(2017).	https://doi.org/10.1017/dmp.2017.116	EXCLUDED	Disaster preparedness training program developed exclusively for healthcare professions students.	Descriptive study presenting the South Dakota model for disaster preparedness and deployment training, aimed at preparing healthcare professions students to support emergency and disaster response activities.	Studies not involving the general population
Preparedness Training Programs for Working With Deaf and Hard of Hearing Communities and Older Adults: Lessons Learned From Key Informants and Literature Assessments.	Kamau, P. W., Ivey, S. L., Griesse, S. E., & Qari, S. H.	(2018).	https://doi.org/10.1017/dmp.2017.112	EXCLUDED	The study focuses on preparedness training for professionals and organizations serving vulnerable populations rather than training interventions directed at the general population.	Study based on key informant interviews and literature review examining preparedness training programs designed to improve emergency planning and response for deaf, hard-of-hearing and older adult populations.	Studies not involving the general population
Community Assessment for Public Health Emergency Response (CASPER): An Innovative Emergency Management Tool in the United States.	Schnall, A., Nakata, N., Talbert, T., Bayleyegh, T., Martinez, D., & Wolkin, A.	(2017).	https://doi.org/10.2105/AJPH.2017.303948	EXCLUDED	Focused on community needs assessment methodology rather than training or preparedness interventions.	Descriptive article presenting the CASPER methodology as a rapid epidemiological assessment tool used to identify community needs, preparedness levels and resource requirements before, during and after emergencies and disasters.	Studies not related to training or preparedness
How Do Doctors and Nurses in Emergency Departments in Hong Kong View Their Disaster Preparedness? A Cross-Sectional Territory-Wide Online Survey.	Lam, R. P. K., Balar, S., Hung, K. K. C., Hsiao, K. H., Leung, L. P., & Learning, J.	(2018).	https://doi.org/10.1017/dmp.2017.71	EXCLUDED	Study focused exclusively on disaster preparedness perceptions among emergency department healthcare professionals.	Cross-sectional online survey assessing self-perceived disaster preparedness, training experiences and response confidence among doctors and nurses working in emergency departments across Hong Kong.	Articles focusing only on healthcare professionals

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Health Care Student Knowledge and Willingness to Work in Infectious Disease Outbreaks.	Patel, R., Wattamwar, K., Kanduri, J., Nahass, M., Yoon, J., Oh, J., Shukla, P., & Lacy, C. R.	(2017).	https://doi.org/10.1017/dmp.2017.18	EXCLUDED	Study focused on healthcare students rather than the general population.	Cross-sectional survey conducted among medical, nursing and pharmacy students to assess knowledge of infectious disease outbreaks, previous disaster training and willingness to work during public health emergencies. Prior disaster training and greater disease-related knowledge were associated with higher willingness to respond.	Studies not involving the general population
Community Emergency Response Team (CERT) Training of High-Risk Teams in the Community of Watts, South Los Angeles, 2013-2014.	Ossey, S., Sylvers, S., Okazyan, S., Smith, L. V., Frye, D., Family, L., Scott, J., & King, J. B.	(2017).	https://doi.org/10.1017/dmp.2016.199	INCLUDED	-	Community-based CERT training combined with First Aid and CPR education for high-risk teens in South Los Angeles to strengthen disaster preparedness, resilience, leadership and community engagement, strengthened community participation, leadership development and local preparedness capacity, resilience.	
Learning lessons in emergency management: the 4th International Conference on Healthcare System Preparedness and Response to Emergencies and Disasters.	Adini, B., Ohana, A., Furman, E., Ringel, R., Golan, Y., Fleisher, E., Keren, U., & Reiser, S.	(2016)	https://doi.org/10.1186/s40696-016-0026-3	EXCLUDED	Conference report focused on healthcare system preparedness and emergency management rather than training interventions for the general population.	Article summarizing discussions, lessons learned and recommendations emerging from an international conference on healthcare system preparedness, disaster response, emergency management and resilience.	Editorials, commentaries, opinion papers, or narrative reviews
Health care in high school athletics in West Virginia.	Schneider, K., Meeteer, W., Nolan, J. A., & Campbell, H. D.	(2017)	https://doi.org/10.2240/5/rh3879	EXCLUDED	Study focused on healthcare resources and emergency preparedness infrastructure in school athletics, not on training programmes or preparedness education for the general population.	Cross-sectional study assessing healthcare availability, emergency planning, athletic trainers and health resources in West Virginia high school athletic programs, identifying barriers related to funding and resource availability.	Studies not related to training or preparedness
Defining Roles for Pharmacy Personnel in Disaster Response and Emergency Preparedness.	Alkhalili, M., Ma, J., & Grenier, S.	(2017).	https://doi.org/10.1017/dmp.2016.172	EXCLUDED	Article focused on pharmacy personnel and professional roles in disaster preparedness and response, not on training or preparedness interventions for the general population.	Conceptual review that develops a framework describing the roles, responsibilities and activities of pharmacists and pharmacy support personnel before, during and after disasters and emergencies.	Articles focusing only on healthcare professionals
Development of Northeast Asia Nuclear Power Plant Accident Simulator	Kim, J., Kim, J., & Po, L. C.	(2017).	https://doi.org/10.1093/rpd/ncw288	EXCLUDED	Simulator developed for nuclear emergency response personnel rather than training or preparedness of the general population.	Study describing the development of the Northeast Asia Nuclear Accident Simulator (NANAS), a computer-based tool integrating source-term estimation, atmospheric dispersion and dose assessment modules to support training and decision-making during nuclear emergency response.	Articles focusing only on healthcare professionals

Titolo	Autore	Anno	PMID/LINK	INCLUIDO/EXCLUIDO	Motivo esclusione	Panoramica	Excluded - Per Prisma
Characteristics of Effective Disaster Responders and Leaders: A Survey of Disaster Medical Practitioners.	King, R. V., Larkin, G. L., Fowler, R. L., Downs, D. L., & North, C. S.	(2016).	https://doi.org/10.1017/dmp.2016.24	EXCLUDED	Study focused on disaster medical practitioners and emergency responders rather than the general population.	Survey of disaster response professionals aimed at identifying key characteristics of effective disaster responders and leaders. The most frequently reported attributes included disaster knowledge, teamwork, communication, adaptability, decision-making and leadership competencies to support workforce development.	Articles focusing only on healthcare professionals
Health Departments' Engagement in Emergency Preparedness Activities: The Influence of Health Informatics Capacity.	Shah, G. H., Newell, B., & Whitworth, R. E.	(2016).	https://doi.org/10.1517/1/ijhpm.2016.48	EXCLUDED	Focused on public health departments and organizational preparedness capacity rather than training or preparedness interventions for the general population.	Quantitative study examining the relationship between health informatics capacity and the level of engagement of public health departments in emergency preparedness activities. Findings suggest that stronger informatics capabilities support preparedness planning, coordination and emergency response functions.	Articles focusing only on healthcare professionals
Improving Team Performance for Public Health Preparedness.	Peck, M., Scullard, M., Hedberg, C., Mollanen, E., Radt, D., Riley, W., Bowen, P. A., Petersen-Kroeber, C., Stenberg, L., & Olson, D. K.	(2017).	https://doi.org/10.1017/dmp.2016.63	EXCLUDED	Study focused on public health preparedness teams and workforce development rather than training or preparedness of the general population.	Descriptive study evaluating a team-development approach designed to strengthen collaboration, communication and operational effectiveness among public health preparedness teams involved in emergency response activities.	Articles focusing only on healthcare professionals
Innovation in Graduate Education for Health Professionals in Humanitarian Emergencies.	Evans, D. P., Anderson, M., Shahpar, C., Del Rio, C., & Curran, J. W.	(2016).	https://doi.org/10.1017/S1049023X16000650	EXCLUDED	Educational program targeting health professionals and humanitarian workers rather than the general population.	Report describing innovative graduate and post graduate educational programs developed by Emory University's Center for Humanitarian Emergencies, including a graduate certificate, field practice and fellowships aimed at strengthening the humanitarian emergency workforce.	Articles focusing only on healthcare professionals
Socio-demographic Predictors for Urban Community Disaster Health Risk Perception and Household Based Preparedness in a Chinese Urban City.	Chan, E. Y., Yue, J., Lee, P., & Wang, S. S.	(2016).	https://doi.org/10.1371/journal.pone.0194521	EXCLUDED	Study assessed disaster risk perception and preparedness behaviors but did not analyze training programmes, educational interventions, or training needs.	Cross-sectional community survey conducted in an urban Chinese population to identify socio-demographic factors associated with disaster health risk perception and household preparedness. Higher preparedness levels were associated with specific demographic and socioeconomic characteristics.	Studies not related to training or preparedness

Titolo	Autore	Anno	PMID/LINK	INCLUID/EXCLUDED	Motivo esclusione	Panoramica	Excluded - Per Prisma
Availability of Automated External Defibrillators in Public High Schools.	White, M. J., Locooh, E. C., Goble, M. M., Yu, S., Duquette, D., Davis, M. M., Odetola, F. O., & Russell, M. W.	(2016).	https://doi.org/10.1016/j.peds.2016.02.019	EXCLUDED	Study focused on availability of AEDs and school emergency response infrastructure rather than training programmes or preparedness education.	Cross-sectional survey assessing the availability, distribution and implementation of automated external defibrillators and emergency response plans in public high schools in the United States.	Studies not related to training or preparedness
A Framework for Training Public Health Practitioners in Crisis Decision-Making.	Kayman, H., & Logar, T.	(2016).	https://doi.org/10.1017/dmp.2015.149	EXCLUDED	Educational framework designed for public health practitioners rather than the general population.	Article describing a competency-based framework aimed at improving crisis decision-making skills among public health professionals involved in disaster and emergency management. The framework integrates leadership, communication, ethical reasoning and emergency response decision-making competencies.	Articles focusing only on healthcare professionals
Physician Emergency Preparedness: A National Poll of Physicians.	SteelFisher, G. K., Blendon, R. J., Brulé, A. S., Lubell, K. M., Jackson Brown, L., Batts, D., & Ben-Porath, E.	(2015).	https://doi.org/10.1017/dmp.2015.114	EXCLUDED	Study focused exclusively on physicians and their emergency preparedness competencies and training.	National survey of U.S. physicians assessing emergency preparedness knowledge, training experiences, participation in preparedness activities, confidence in responding to disasters and perceived readiness for different emergency scenarios.	Articles focusing only on healthcare professionals
Understanding Community-Level Disaster and Emergency Response Preparedness.	Shannon C.	(2015).	https://doi.org/10.1017/dmp.2015.38	INCLUDED	-	Participants successfully completed disaster preparedness training, increased emergency response knowledge and practical skills, and demonstrated improved readiness to assist themselves and their communities during disasters.	

Appendix B. Complete Data Extraction Table

This appendix presents the complete data extraction table for the fourteen studies included in the scoping review. For each study, the table reports the key characteristics extracted during the charting process, including study design, country, target population, educational intervention, disaster context, outcomes assessed and the principal training needs identified. The data extraction was performed using a structured charting framework to ensure consistency and transparency throughout the review process.

Titolo	Autore	Anno	PMID/LINK	Paese	Tipologia di studio	Popolazione coinvolta	Obiettivo	Tipologia di intervento formativo	Principali risultati formativi	Eventuali raccomandazioni	Main competency area
First aid training in conflict zones: An interventional training study and a post-training knowledge assessment.	Jafar, K., Janoud, R., Sheikh Sobeh, A., Al-Deeb, R., & Janoud, O.	2026	https://doi.org/10.1177/20503121261449059	Conflict zones (likely Middle East/Syria-related context – verifica nel full text il paese preciso)	Interventional training study	Lay population / civilians living in conflict zones	To evaluate the effectiveness of first aid training programmes and assess post-training knowledge among civilians in conflict settings.	First aid and emergency response training	Training improved participants' knowledge and preparedness regarding basic first aid and emergency response actions in conflict-related emergencies.	Strengthen community-based first aid education programmes in conflict and disaster settings to improve early emergency response capacity.	First aid / Emergency response / Community preparedness
The Effect of Awareness-Based Disaster Education on Women's Disaster Awareness and Preparedness: A Randomized Controlled Study.	Sögüt, S. C., & Kiliçarslan, T.	(2026)	https://doi.org/10.1111/phn.70103	Turkey	Randomized Controlled Trial (RCT)	Adult women / lay population	To evaluate the effect of awareness-based disaster education on disaster awareness and preparedness levels among women.	Awareness-based disaster education programme focused on preparedness and disaster response.	Disaster education significantly improved participants' disaster awareness and preparedness levels. Educational interventions increased knowledge and preparedness behaviors.	Community-based disaster education programmes should be promoted to improve preparedness among the general population, especially vulnerable groups such as women.	Disaster awareness and preparedness training
Building Resilient Communities: A Participatory Approach to Flood Disaster Preparedness in Thailand.	Thronsao, M., Chaipayrom, K., Thronsao, C., Sripol, C., Chanthamath, S., & Wongkongdech, R.	(2026)	https://doi.org/10.1097/PHH.00000000000002298	Thailand	Participatory community-based study / community intervention study	Lay population / local communities exposed to flood risk	To improve community flood disaster preparedness through a participatory and community-centered approach	Community disaster preparedness education, participatory training activities, resilience-building initiatives	Participatory approaches improved disaster awareness, preparedness behaviors, and community engagement in flood preparedness	Promote community participation in disaster preparedness programmes and strengthen locally adapted resilience strategies	Flood preparedness, community resilience, disaster awareness, self-protective behaviours, community-based preparedness

Titolo	Autore	Anno	PMID/LINK	Paese	Tipologia di studio	Popolazione coinvolta	Obiettivo	Tipologia di intervento formativo	Principali risultati formativi	Eventuali raccomandazioni	Main competency area
A practice-oriented framework for basic life support training of Brazilian school teachers: Integrating Law 13,722/2018, andragogy, and the health belief model.	Carvalho Castanha, C. S., Guerrero Daboin, B. E., Zangirolami-Raimundo, J., Barbosa Tavares, L. F., de Abreu, L. C., & Raimundo, R. D.	(2025)	https://doi.org/10.3389/fpubh.2025.1616459	Brazil	Educational framework study / practice-oriented training model	Brazilian school teachers (lay population)	To develop a practice-oriented framework for basic life support (BLS) training for school teachers	Basic life support training, emergency response education, practical preparedness training	The integration of andragogy principles and the Health Belief Model may improve engagement, preparedness, and effectiveness of BLS training among school teachers	Develop structured and context-specific BLS educational programmes for non-healthcare community members such as teachers	Basic life support, emergency response, first aid, preparedness education, lay responder training
Community volunteer participation and its determinants during respiratory infectious disease outbreaks in China: A cross-sectional study across multiple provinces.	Jin, H., Ding, X., Li, Z., Cao, J., Sun, X., Ji, Y., & Ning, F.	(2025)	https://doi.org/10.3389/fpubh.2025.1616459	China	Cross-sectional study	Community volunteers / general population	To explore factors influencing community volunteer participation during respiratory infectious disease outbreaks	Community preparedness and volunteer participation activities (indirect preparedness-related intervention)	Community participation in outbreak response is influenced by preparedness awareness, social engagement, and motivational factors	Strengthen community preparedness strategies and promote volunteer engagement through education and preparedness initiatives	Community preparedness, volunteer engagement, outbreak response, public health emergency participation
Teaching Methodologies for First Aid in Physical Education in Secondary Schools: A Systematic Review.	Parada-Espinosa, J. M., Ortega-Gómez, S., Ruiz-Muñoz, M., & González-Silva, J.	(2025)	https://doi.org/10.3389/fpubh.2025.1616459	Multiple countries / not specific	Systematic review	Secondary school students and educational settings (lay population)	To analyse teaching methodologies used for first aid education in secondary school physical education	First aid education, school-based emergency preparedness training, practical educational methodologies	Active and practical teaching methodologies improve first aid learning, engagement, and preparedness competencies among students	Integrate structured first aid education into school curricula using interactive and practice-oriented methods	First aid, emergency response, preparedness education, school-based training, self-protective behaviours

Titolo	Autore	Anno	PMID/LINK	Paese	Tipologia di studio	Popolazione coinvolta	Obiettivo	Tipologia di intervento formativo	Principali risultati formativi	Eventuali raccomandazioni	Main competency area
Knowledge and Awareness About the Basics of Cardiopulmonary Resuscitation in the Saudi Population.	Alshammar i, S., Alshammar i, A. H., Aldosari, M., Aldawsari, H. A., & Almass, A.	(2025)	https://doi.org/10.7759/cureus.77950	Saudi Arabia	Cross-sectional study	Saudi general population	To assess knowledge and awareness regarding basic cardiopulmonary resuscitation (CPR) among the Saudi population	CPR awareness and emergency preparedness education (knowledge assessment study)	The study identified gaps in CPR knowledge and awareness among the general population, highlighting the need for wider public training initiatives	Expand community CPR education programmes and increase public access to first aid and emergency response training	Cardiopulmonary resuscitation (CPR), first aid, emergency response, lay responder preparedness
Scoping Review of Virtual Reality (VR)-Based Disaster Mitigation Education.	Kimura, R., Fukushima, A., Kajiwar, K., Sakuramoto, H., Yoshihara, S., Harada, K., Nakayama, T., & Ito, A.	(2024)	https://doi.org/10.7759/cureus.74062	Multiple countries / not specific (scoping review)	Scoping review	General population, students, community participants involved in disaster education programmes	To review the use and effectiveness of virtual reality-based disaster mitigation education	Virtual reality disaster preparedness education, simulation-based learning, disaster mitigation training	VR-based education improves engagement, experiential learning, disaster awareness, and preparedness competencies	Integrate immersive and simulation-based technologies into disaster preparedness education programmes	Disaster preparedness, disaster mitigation education, risk awareness, simulation-based training, emergency response education
Preparedness of the community in facing disasters like earthquakes (Case: Cisarua, Indonesia).	Parmungkas, T. D., Allyan, S. A., Nurfalih, I., Ningrum, E., & Maryani, E.	(2023)	https://doi.org/10.4102/jamba.v15i1.1438	Indonesia	Cross-sectional community survey	80 community residents from six earthquake-prone villages in Cisarua District	To assess community preparedness for earthquake disasters and identify preparedness gaps.	No formal intervention; assessment of preparedness and need for disaster education/training.	Community preparedness was low/moderate; deficiencies were identified in emergency planning, disaster warning systems, and resource mobilization. Increased disaster education and preparedness training were recommended.	Implement regular disaster preparedness education, emergency response training, and community awareness programs to improve earthquake readiness.	Risk Awareness & Preparedness / Disaster Education / Emergency Planning

Titolo	Autore	Anno	PMID/LINK	Paese	Tipologia di studio	Popolazione coinvolta	Obiettivo	Tipologia di intervento formativo	Principali risultati formativi	Eventuali raccomandazioni	Main competency area
Constructing an emergency preparedness evaluation index system for public use during major emerging infectious disease outbreaks: a Delphi study.	Wei, W., Liu, Y., Zhou, N., Tian, M., Xie, L., Watson, R., Dai, F., Chen, Y., & Hu, W.	(2023)	https://doi.org/10.1186/s12889-023-15980-6	China	Delphi study / methodological study	Expert panel in public health, emergency management, infectious disease control, and nursing	To develop and validate an evaluation index system for assessing public preparedness during major infectious disease outbreaks.	No direct intervention; development of a preparedness assessment framework.	Public preparedness depends on competencies related to knowledge, emergency response capacity, resource preparedness, health literacy, and risk awareness.	Use the index system to guide preparedness assessment and develop targeted public education and preparedness programs.	Emergency Preparedness / Health Literacy / Risk Awareness
Design of a Virtual Reality Interactive Training System for Public Health Emergency Preparedness for Major Emerging Infectious Diseases: Theory and Framework.	Luo, Y., Li, M., Tang, J., Ren, J., Zheng, Y., Yu, X., Jiang, L., Fan, D., & Chen, Y.	(2021)	https://doi.org/10.2196/29956	China	Methodological study / Framework development	General population	To design a Virtual Reality Interactive Training System (VRITS) aimed at improving public health emergency preparedness for major emerging infectious diseases.	Virtual reality-based interactive training using immersive simulation scenarios and preparedness competency modules.	The framework identified 20 core preparedness competencies and proposed a VR-based training model to enhance emergency preparedness knowledge, risk awareness, decision-making, and response behaviors through experiential learning.	Future research should validate the effectiveness of the VRITS through implementation studies and assess its impact on preparedness outcomes in different populations.	Emergency preparedness education and training; Public health emergency preparedness; Risk awareness and response competencies

Titolo	Autore	Anno	PMID/LINK	Paese	Tipologia di studio	Popolazione coinvolta	Obiettivo	Tipologia di intervento formativo	Principali risultati formativi	Eventuali raccomandazioni	Main competency area
Factors Associated With Individual Emergency Preparedness Behaviors: A Cross-Sectional Survey Among the Public in Three Chinese Provinces.	Ning, N., Hu, M., Qiao, J., Liu, C., Zhao, X., Xu, W., Xu, W., Zheng, B., Chen, Z., Yu, Y., Hao, Y., & Wu, Q.	(2021)	https://doi.org/10.3389/fpubh.2021.644421	China	Cross-sectional survey with structural equation modeling	2,506 adults from three Chinese provinces	To identify factors associated with individual emergency preparedness behaviors among the public	Emergency preparedness training and drills/exercises	Only 28% of participants reported being prepared. Training/exercises showed a significant positive association with preparedness behaviors and improved self-efficacy and preparedness capacity.	Increase public preparedness education, training opportunities and emergency drills to strengthen preparedness behaviors and self-efficacy.	Emergency preparedness education and community preparedness
Community Emergency Response Team (CERT) Training of High-Risk Teens in the Community of Watts, South Los Angeles, 2013-2014.	Ossey, S., Sylvers, S., Oksuzyan, S., Smith, L. V., Frye, D., Family, L., Scott, J., & King, J. B.	(2017)	https://doi.org/10.1017/dmp.2016.199	United States	Community-based educational intervention / Program evaluation	High-risk adolescents from the Watts community, South Los Angeles	To evaluate the feasibility and outcomes of CERT disaster preparedness training among vulnerable adolescents	Community Emergency Response Team (CERT) training combined with First Aid and CPR instruction	Participants successfully completed disaster preparedness training, increased emergency response knowledge and practical skills, and demonstrated improved readiness to assist themselves and their communities during disasters.	Expand preparedness programs targeting vulnerable youth populations and strengthen community engagement in disaster readiness initiatives.	Disaster preparedness education and community emergency response skills

Titolo	Autore	Anno	PMID/LINK	Paese	Tipologia di studio	Popolazione coinvolta	Obiettivo	Tipologia di intervento formativo	Principali risultati formativi	Eventuali raccomandazioni	Main competency area
Understanding Community-Level Disaster and Emergency Response Preparedness.	Shannon C.	(2015)	https://doi.org/10.1017/dmp.2015.28	United States	Conceptual / narrative review	General population and local communities	To examine factors influencing community-level disaster and emergency preparedness and propose a framework for understanding community readiness.	Community preparedness framework and preparedness education concepts	Community preparedness is influenced by knowledge, social networks, communication systems, local engagement and access to resources. Preparedness should be viewed as a community-wide process rather than solely an individual responsibility.	Strengthen community engagement, preparedness education and local resilience-building initiatives to improve emergency response capacity.	Community preparedness and resilience

Appendix C. Thematic Frequency Analysis (Pivot Table)

This appendix presents the pivot table used to summarise the frequency with which each thematic area emerged across the included studies. The analysis was generated from the coded data extraction matrix and supported the identification of the four principal training need areas reported in the Results section. The pivot table represents an intermediate analytical step used to enhance the transparency and reproducibility of the thematic synthesis.

<i>Excluded - Per Prisma</i>	COUNTA di Excluded - Per Prisma
	0
Articles focusing exclusively on clinical or hospital-based emergency management	4
Articles focusing only on healthcare professionals	36
Editorials, commentaries, opinion papers, or narrative reviews	2
Full text not available	1
Studies not involving the general population	8
Studies not related to training or preparedness	18
Totale generale	69

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