




Disaster Preparedness Education among Community: What is effective? An Integrative Literature Review

Iwan Permana^{1,2*} , Faridah Mohd Said³, Nur Syazana Umar¹, Johan Budhiana²

¹Lincoln University College, Kota Bharu, Malaysia; ²Sekolah Tinggi Ilmu Kesehatan Sukabumi, Sukabumi, Indonesia; ³Postgraduate Nursing Studies, Faculty of Nursing, Lincoln University College, Malaysia

Abstract

Edited by: Ana Vucurevic

Citation: Permana I, Said FM, Umar NS, Budhiana J. Disaster Preparedness Education among Community: What is effective? An Integrative Literature Review. Open Access Maced J Med Sci. 2022 Feb 15; 10(G):1-8. https://doi.org/10.3889/oamjms.2022.8373

Keywords: Disaster preparedness; Disaster training; Disaster education; Community-based; Review
*Correspondence: Iwan Permana, Lincoln University, College Malaysia and Sekolah Tinggi Ilmu Kesehatan Sukabumi, Indonesia. E-mail: iwanpermana442@gmail.com

Received: 22-Dec-2021

Revised: 31-Jan-2022

Accepted: 05-Feb-2022

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Funding: This research did not receive any financial support

Competing Interests: The authors have declared that no competing interests exist

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BACKGROUND: Community-based disaster preparedness is vital in all types of disaster scenarios. Despite having resources and post-disaster training, growing evidence indicates that many residents struggle to prepare ahead of a disaster.

AIM: The aim of this review was to evaluate the effectiveness of disaster preparedness education for community.

METHODS: A literature search was conducted using a combination of the following keyword: “disaster planning” or “disaster preparedness” or “disaster training” and “evaluation or outcomes of education” and “community” or “family” Medline database through OVID and ProQuest Social Sciences Journals.

RESULTS: The review included fourteen articles, seven studies were quantitative, four qualitative studies, and three mixed-method studies. The education contents were related to psychological first aid, evacuation sites and routes in times of disaster, items to prepare in case of emergency, preparing for safety inside a home, community mapping, responding to psychological trauma, and building sustainability into community work.

CONCLUSION: All strategies and content used in disaster preparedness tend to enhance community preparedness. More research is needed to identify best practices for community disaster preparedness by using more rigorous methods and considering the local needs or barriers in designing education programs.

Introduction

Disasters are complex physical, emotional, cultural, and political phenomena that are frequently incompatible with trends or known boundaries. There were 416 natural disaster events worldwide in 2020. The Asian Pacific region encounters the second-highest number of natural disasters event worldwide [1]. Natural disasters strike almost every country on the planet. In 2018, Indonesia suffered the highest mortality rate in the world due to the earthquakes and tsunami that struck the country in September [2]. In the United States that year, tropical cyclones, forest fires, high temperatures, and water shortage claimed the majority of fatalities from natural disasters. The most significant natural disaster in the U.S. was the 2005 hurricane, as it spread across the coastlines. Hurricanes in North America were responsible for four of the top five most damaging natural disasters between 2010 and 2019 [1]. The UN’s head of disaster planning has cautioned that failing to prepare for potential natural disasters would have “unimaginably negative” effects, particularly as climate change increases the frequency of naturally occurring disasters and the humanitarian crises that often follow [3]. The UN and others have

urged increased focus on preparedness efforts, which currently receive only 0.4% of global aid funding (in 2014). The effects of climate change are increasing in frequency, and a crisis declaration will meet the impact on public health [4].

Engaging with community preparation is vital in all types of disaster scenarios. Even in low-cost settings, vulnerable populations, such as communities and schools, cost-effective mitigation strategies can be found, such as avoiding evacuation routes, safeguarding essential documents, assembling disaster preparedness kits, and encouraging youth training. Growing evidence suggests that many residents fail to plan ahead of disaster despite obtaining resources and after-the-effects training [5], [6], [7]. There is some evidence that prior disaster exposure does not increase motivation; in some cases, it appears to lower it [8], [9], [10]. In addition to disaster response planning, the community has established advocacy and education courses on disaster readiness and preparedness, which will be provided through its primary health care (PHC) network.

Community-based disaster preparedness (CBDP) is a type of local-level capacity building becoming more relevant in risk reduction and disaster management strategies. CBDP initiatives make use of local community

resources' expertise and skills. CBDP implementation involves a thorough understanding of the populations concerned [11]. Non-governmental organizations (NGOs) such as the American Red Cross and the Salvation Army are well-equipped to execute CBDP strategies. Furthermore, it is acknowledged that governments alone will not accomplish meaningful, long-term risk mitigation. A greater focus on local-level and community-based interventions funded by NGOs or other community-based organizations is needed [12], [13]. This suggests that disaster preparedness methods which include the resolution of disaster-related mental health problems may be more successful [10], [14]. Several studies have examined how well societies are prepared for disasters. However, few population-based interventional studies in the literature show how successful a public health program prepares for natural disasters [15], [16]. This integrative literature review aimed to look at both qualitative and quantitative studies and better understand the research and the current state of knowledge about the effectiveness of disaster preparedness education for the community [17], [18]. The findings can be used to guide future research and information creation so that health care providers, experts, and emergency planners can better prepare communities for disasters.

Methods

Search methods

Databases were searched between 1st and 10th December, 2020, to identify primary research articles that explored disaster preparedness programs for the community level. A literature search was conducted using combination of the following keyword: "disaster planning" or "disaster preparedness" or "disaster training" and "evaluation or outcomes of education" and "community" or "family" Medline database via OVID (US National Library of Medicine) and ProQuest Social Sciences Journals. The search was restricted to publications in either Bahasa Indonesia or English on human-related research. The search was limited to specific publishing dates from January 1st, 2010, to December 30th, 2020 (Table S1).

Searching criteria

Articles were included when reporting primary studies on the disaster preparedness program for the community. The articles were excluded from systematic or literature reviews or discussions papers. Two reviewers conducted an independent screening of the titles and abstracts that were obtained from the database. After reading all the full texts, we decided to include studies. Disagreements between two reviewers (first and second authors) over which publications met

the inclusion criteria were resolved with the help of the third reviewer.

Quality appraisal

The mixed-method appraisal tool (MMAT) was utilized to analyze qualitative, quantitative, or mixed-method studies [19]. In this review, research articles had to achieve an MMAT score of 50% or higher, indicating solid research and had a sufficient volume to allow a comprehensive exploration of the subjects and methods defined in existing studies.

Data abstraction

IP and JB carried out data abstraction. Each study has been read and re-read in detail, accompanied by an iterative extrapolation and examination of relevant data. Included papers were subjected to a review and study of the key topics, research methodology, conclusions, and the identification of information gaps. This analysis resulted in developing a data table, which is available from the primary author. The details of each article included are shown in Table 1.

Results

Search outcome

After duplicates were excluded, the papers selected from the above searches (based on title, keyword, and abstract review) yielded a total of 625 articles (Figure 1). The screening process eliminated approximately 549 papers, and 62 papers were excluded after thorough reading and evaluate the

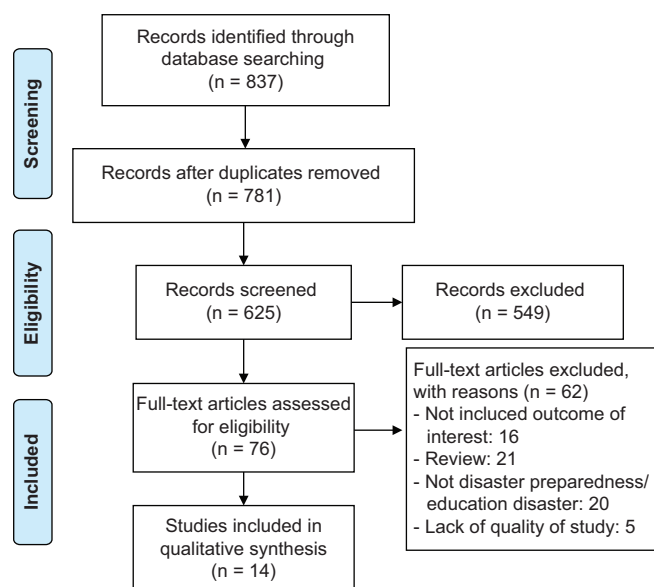


Figure 1. PRISMA flow diagram

Table 1: Characteristics of included studies (n = 14)

Authors, years	Country	Study Design	Sample	Programs	Tools/Analysis	Findings
(20)	Iran	A controlled community intervention trial with pre- and post-assessments	The number of households in the urban and rural intervention areas were 5562 and 3638, respectively (total, 9200), and the number of households in the control area was 6123 and 3887, respectively (total, 10 010)	The intervention educational package included the discussion of (1) the health consequences of earthquake and flood hazards to individuals and households; (2) participatory risk mapping; (3) household emergency planning—including the importance of conducting a preparedness meeting, having a communication plan, preparing an emergency kit with emergency personal information card, and having a plan for vulnerable groups in the household; and (4) drill performance	Household awareness and readiness scores regarding common natural disasters, and disaster risk perception	An educational intervention administered through the public health center system effectively improved disaster awareness and readiness at a community level
(23)	USA	Qualitative study	11 community sectors: business, emergency management, housing and sheltering, community leadership, cultural and faith-based groups and organizations, health care, social services, media, mental/behavioral health, a state office of aging (or its equivalent), and education and childcare settings.	The Los Angeles County Community Disaster Resilience (LACCDR): education, engagement, partnership, and community self-sufficiency. Toolkit sections included: Psychological First Aid, Community Mapping, Community Engagement Principles for CR, Identify and Develop Community Leaders, and Training Community Field Workers.	Behaviors, knowledge, and attitudes/Qualitative content analysis	Education, community self-sufficiency, and engagement, but increasing partnerships is challenging.
(24)	USA	Interviews and Focus Groups	n = 6 coalition members; n = 16 facilitators	CR coalitions received training via a toolkit that included information on what community resilience is, how to focus on community assets, mapping hazards in the neighborhood, identifying vulnerable groups, recognizing and responding to psychological trauma, and how to build sustainability into community work	Thematic analysis of data from focus groups (n = 5) and interviews (n = 6 coalition members; n = 16 facilitators)	Activity log analyses identified four types of coalition activities: fairs, events, outreach, and training. Four distinct strategies used by coalitions to operationalize the four levers of community resilience (engagement with community, organizational partnerships, community self-sufficiency, and education and training) through community participation: (1) anchoring resilience in preparedness, (2) embracing diversity, particularly as a part of the engagement, (3) engaging while educating about the disaster cycle, and (4) finding reciprocity partnerships among organizations. A significant shift over time from awareness to action and maintenance stages for disaster communication plans and supplies in both study arms
(21)	USA	randomized, longitudinal cohort design with two groups	Community-dwelling Latino immigrant adults. Respondent-driven sampling	Using a framework of stage theories of behavior change. (i) household preparedness education received through 'promotor' (community health worker) led small group meetings, and (ii) household preparedness education received through print media. Weinstein's Precaution Adoption Process, a stage model appropriate for risk communication guided the intervention	Stage of decision making about household disaster preparedness based on respondents	Volunteers are being trained in disaster preparedness and response techniques to help people cope with mental health-related distress after a natural or man-made disaster. The training uses an experiential approach, including facilitated discussion and peer-support and hands-on training for use by participants.
(33)	Haiti	Randomized controlled trial (RCT) design	Vulnerable communities in metropolitan Port-au-Prince,	Using a framework of stage theories of behavior change. (i) household preparedness education received through 'promotor' (community health worker) led small group meetings, and (ii) household preparedness education received through print media. Weinstein's Precaution Adoption Process, a stage model appropriate for risk communication guided the intervention	Disaster preparedness, Depression, PTSD, Anxiety, Functional impairment, social cohesion	the intervention increased disaster preparedness, reduced symptoms associated with depression, post-traumatic stress disorder, anxiety, and functional impairment, and increased peer-based help-giving and help-seeking. Mediation models indicated support for the underlying theoretical model, such that the effect of the intervention on preparedness was mediated by mental health, and that effects on mental health were likewise mediated by preparedness. Effectiveness ratings were very high, with 86% rating it 5 and 12% rating it 4 (2% did not answer).
(31)	USA		Community Health Worker	Training sessions were conducted over two weeks at commercial hotels. Curricula consist of basic and specific training module. Classes were conducted from 9 am to 4:30 pm, with an hour break for lunch. Most of the modules delivered in either a 3-h morning session or a 3½-h afternoon session.		
(25)	USA	Mixed-methods approach consisting of collaborative learning activities, a function-based assessment tool, and a 5 Steps to preparedness module	Partner agencies recruited CHSO representatives for the trainings	Community engagement and integration into preparedness systems, the risks of human vulnerability, and the complexities of vulnerable population disaster readiness. collaborative learning activities, a function-based assessment tool, and a 5 Steps to Preparedness module	Awareness, preparedness level	Satisfaction with the training format and content; increases in awareness of a client preparedness role; and improved personal, agency, and client preparedness. CRLC offered an innovative training to reach and improve preparedness levels for vulnerable populations.
(30)	USA	In-depth semi-structured interviews	Interview (n = 14)	Environmental health (EH), emergency preparedness and response (EPR) programs can provide essential service, or how to "mobilize community partnerships and actions to identify and solve EH problems"	Content analysis approach	highly confident in their workforces' efficacy, ability, willingness, and motivation to directly engage local communities in community environmental health emergency preparedness.

(Contd...)

Table 1: (Continued)

Authors, years	Country	Study Design	Sample	Programs	Tools/Analysis	Findings
(26)	USA	Mixed-methods approach	Faith-based organization leaders		Community involvement, and social behavior/Frequency distribution and thematic analysis	Quantitative: strong social networks among congregation and community members. Qualitative: (1) perceived disaster preparedness and resiliency; (2) barriers to community preparedness and resiliency; (3) lessons learned from past disasters; (4) social services and networks; and (5) willingness to be prepared.
(22)	USA	Randomized controlled trial (RCT) design	Adult with disability using convenience sampling	Personal emergency plan, portable and home emergency kit, knowledge to protect emergency supply kits, knowledge to protect themselves from hazards in a disaster	Disaster preparedness and earthquake safety knowledge/Generalized estimating equation	The Peer-Mentored preparedness significantly increased preparedness by 19 percentage point and improve their knowledge by 8 percentage point
(27)	USA	Semi structured interview guide	Age > 18 years, volunteers or worked at community-based organization. n = 67	C-LEARN employs a community-partnered participatory research (CPPR) approach that promotes equal power, 2-way knowledge sharing, and community involvement in all aspects of the research process.	Content analysis approach	1. Maintaining continuous, effective communication and year-round network building with other agencies; 2. Forging pre-disaster strategic partnerships with individuals and organizations that recognize and value the need for planning for a community's unique needs; 3. Providing appropriate education and training; and 4. Building an integrated system that enables rapid disaster response
(32)	Hong Kong	Focus group discussion and Cross-sectional survey	Households were recruited using snowball sampling	Nutbeam's model for health promotion was employed for planning the health promotion programme: (i) problem definition; (ii) solution generation; and (iii) capacity building. Interactive workshop to train villagers on disaster preparedness. The disaster intervention used a poster to illustrate the importance and contents of a disaster kit	Thematic analyses/descriptive statistics	Nutbeam's planning model for developing a tailored health-EDRM programme,
(28)	Japan	Pre- and postintervention	226 women participated in this study. They were all at second trimester of pregnancy and ever received childbirth education classes.	The contents of this programme were (1) the importance of preparedness, (2) contact methods with families in times of disaster, (3) receiving medical examination in times of disaster, (4) evacuation sites and routes in times of disaster, (5) items to prepare in case of emergency, and (6) preparing for safety inside a home.	Six questions on awareness modification and seven questions on behavior modification	An intervention effect was found in items concerning awareness modification (five of six items) and behavior modification (three of seven items). The intervention effect was particularly pronounced in a comparison of primiparous without disaster experience.
(29)	Nepal	Quasi-experimental design	Two communities in Bhaktapur district, Nepal.	Hybrid mental health and disaster preparedness intervention. The mental health integrated disaster preparedness intervention utilizes an experiential approach, including facilitated discussion, space for sharing personal experiences and exchange of peer-support, establishing safety and practicing coping skills targeting disaster-related distress, and hands-on training in disaster preparedness and response techniques for use by participants in their own lives and to support other community members. The 3-day intervention was culturally adapted, facilitated by trained Nepalese clinicians and focused on enhancing disaster preparedness, mental health, and community cohesion	Disaster preparedness, Depression, PTSD, Anxiety, Functional impairment, social cohesion, Help-seeking	Participation in the intervention increased disaster preparedness, decreased depression- and PTSD-related symptoms, and increased social cohesion. Mediation models indicated that the effect of intervention on depression was partially explained by preparedness

study's quality. These papers were excluded due to many reasons, including not meet the inclusion criteria, review paper, and MMAT score below 50%.

Around 549 papers were excluded during the screening process, and 62 were discarded after complete reading and quality evaluation, mostly because they were not in the area of study; they were not primary research articles; or they did not earn an MMAT score of 50% or higher once quality evaluated.

Quality appraisal

The review included fourteen articles, seven of which were quantitative, four were qualitative, and three were mixed-method studies. Only four articles were rated as 100% using the MMAT [10], [20], [21], [22],

and a further 9 were rated at 75% (missing one of the criteria) [23], [24], [25], [26], [27], [28], [29], [30]. One was rated at 50% (missing two criteria) [31], and studies rated lower than this were excluded from the review. In general, research articles on community preparation and disaster support were lacking in quality.

Analysis

Of the seven quantitative researches evaluating disaster preparedness interventions, four were randomized controlled trials [10], [20], [21], [22], with one study using longitudinal cohort design (Figure 2) [21]. These researchers found that improving hazard understanding and preparedness at the community level decreased depression, PTSD, anxiety, and

functional disability symptoms. Two studies included in this review were pre- and post-test studies using a convenience sample [28], [29], [31]. Results show that any intervention increases perceived preparedness for a disaster and a disaster-related stress, as well as the known psychological measures, such as symptoms. One limitation of these studies was that they used a single, non-randomly selected sample, and the interventions could not be compared for effectiveness to other interventions. As a consequence of the non-random selection and single group nature, the results could not be generalized.

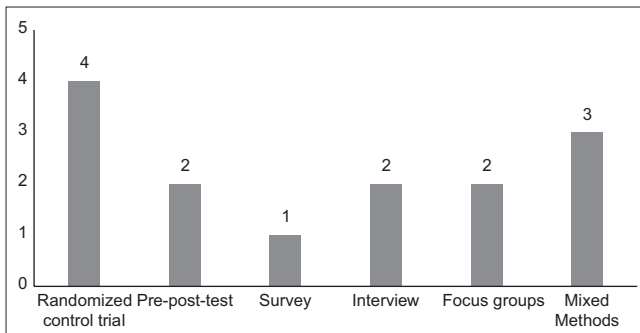


Figure 2: Design of included studies (n=14)

This study relied on questionnaires or tests to determine whether or creative methods were more effective [31]. Because the studies used nonrandomized, convenience samples, caution was advised when applying these findings to disaster preparedness at other locations and contexts. A previous study found that the intervention's effectiveness was very high (86% rating it 5 and 12% rating it 4).

Four of the research articles included in the review were qualitative; three of them collected data through in-depth interviews with semi-structured guidelines and one focus group discussion [23], [24], [27], [30]. These researches have the advantage of being able to classify data on community preparedness needs and barriers. Integrating people and institutions before a disaster strikes and strengthening connections ahead of time are also important aspects of disaster management, as (1) keeping constant communication and (2) identifying the diverse communities that need planning (3) are both main considerations. Continuously empowering groups is also in place, along with other strategies such as forging alliances and developing long-term relationships with partners who recognize and respect the need for planning for communities to be ready for disasters. Pre-appointed groups to forge friendships and partnership.

Three studies used mixed methods to test the effectiveness of the developed intervention [25] that found satisfaction with the training format and content; increases unawareness of a client preparedness role; and steps toward improved personal, agency, and client preparedness. While the others two mixed-methods were focused on program development [26], [32]. Two studies investigated the effects of combining mental health and

disaster preparedness interventions [29], [33]. The disaster mental health intervention uses an experiential approach, which incorporates learning, discussion, and techniques to identify and handle distress, while strengthening coping abilities. The 3-day program is culturally adapted, facilitated by Nepalis, and offers disaster readiness, as well as well as mental health. Researchers sought to determine what particular content form people were prepared for and how to deal with various disasters before reviewing preparedness services and community knowledge/awareness [29], [32]. Some studies were solely concerned with technical disaster preparedness [20], [21], [22], [28]. In addition, some studies discovered that content can be customized to meet local needs [25].

Two studies used a theoretical framework to develop the intervention, namely Nutbeam's model for health promotion [32] and stage of theories of behavior change [21]. Nutbeam's health promotion model includes the following components: (1) problem definition, (2) solution generation, and (3) capacity building. Villagers will participate in an interactive workshop to learn about disaster preparedness. Using a poster to teach first aid provided a perfect illustration of how important it is to have a disaster kit on hand [32]. While in the behavior change stage, the program included two components: (1) household preparedness education delivered through "promotor" (community health worker-led small group meetings) and (2) household preparedness education delivered through print media.

The educational package developed in Iran included a discussion of (1) the health consequences of earthquake and flood hazards to individuals and households; (2) participatory risk mapping; and (3) household emergency planning—including the importance of holding a preparedness meeting, having a communication plan, preparing an emergency kit with an emergency personal information card, and having a plan in place [20].

The education contents of other studies were related to psychological first aid, contact methods with families in times of disaster, receiving medical examination in times of disaster, evacuation sites and routes in times of disaster, items to prepare in case of emergency, preparing for safety inside a home, community mapping, community engagement principles, how to identify and develop community leaders, and training community field workers, identifying vulnerable groups, recognizing and responding to psychological trauma, and how to build sustainability into community work [22], [23], [24], [25], [27], [28], [30], [31].

Discussion

Disaster education can be defined as preparing the public through established competencies,

presenting a body of information and general knowledge, or educating individuals on all aspects of safety and the community, building a baseline of knowledge on potential issues, and mitigating disasters with proper preventative measures. Non-technical skills and abilities relevant to disasters may be covered elsewhere; this area can be effectively explored by asking the community to describe their past experiences with a question that can lead to this important insight. Human skills, such as resilience, teamwork, and physical fitness, enable communities to work well in disasters. We discovered a number of challenges in defining community preparedness and developing success metrics and similar knowledge gained over time. Challenges arose from (a) identifying community, (b) evaluating meaningful community participation, and (c) deciding how to collect and analyze community preparedness data from the Public Health Emergency Preparedness (PHEP).

Most studies focused on community/household, vulnerable groups, or facilitators. There is little information about disaster preparedness at the family level, although all family members play essential roles in various disasters. All of the studies included in the review focused on preparation for or assessing natural disasters. No research met the inclusion criteria that focused on disaster preparedness or assessment. Future studies should focus on how to better determine how communities can plan for or share lessons learned from natural and manmade disasters. None of the disaster preparedness courses studied in the literature included non-technical or non-structural disaster skills or expertise. On the other hand, these abilities are essential for a community to function effectively during a disaster. Qualitative research was investigated, which prompted the community to provide open-ended questions.

Participation in the intervention was linked to a substantial improvement in disaster preparedness. Participants in the intervention took part in multiple sessions to improve their preparedness awareness and skills. The intervention also decreased depression, PTSD (overall and avoidance subscale), anxiety, and functional impairment, measured using culturally adapted tools. Improved training protocols that teach communities how to address the needs of their communities or families in the event of a disaster are critical. In addition, direct input on current training curricula from the community or family should be received. Family members and local residents must be ready to assist each other, and devise plans that take into account a variety of factors, including medication availability and mobility. Emergency responders must build partnerships with the community (both leaders and participants at large), involving them in preparedness events, soliciting input, and empowering community members through ensuring that they have personal preparedness plans and supplies.

Limitation

Of the 14 studies, only four were given an MMAT score of 100%. The majority of quantitative studies used community convenience samples and a pre- and post-test or survey to assess the readiness or effectiveness of community-building educational strategies. All studies have shown changes in community disaster preparedness following the introduction of a training program; however, this change is difficult to verify and generalize due to the study design. Future disaster preparedness studies must employ a high-quality research methodology suitable for the study to better educate preparedness.

Conclusion

The study's findings indicated that disaster preparedness for communities is a relatively new discipline that has gained traction. While disasters are not a recent phenomenon, they occur in communities, and research to enhance disaster preparedness may be needed. All of the strategies and content used in disaster preparedness tend to enhance community preparedness. Given the issues with research design, determining what content or delivery methods are most effective is difficult. Future research would need to address what type of content should be delivered and how it should be delivered. Identifying differences in community needs and the preparation required for various types of disasters will be equally important. More research is needed to identify best practices for community disaster preparedness. The literature suggests that there are undoubtedly areas for improvement. Despite a renewed emphasis on disaster preparedness in recent years, many communities are unprepared for or incapable of surviving disasters.

References

1. Jaganmohan M. Natural Disasters Events 2000-2020 Published by Madhumitha Jaganmohan, Feb 2, 2021 In 2020, there were a Total of 416 Natural Disasters Events Worldwide. The Asian Pacific Region Experienced the Second Highest Number of Natural Disasters, Most Likely Du. Available from: <https://www.statista.com/statistics/510959/number-of-natural-disasters-events-globally> [Last accessed on 2020 Dec 20].
2. Dewi DP. Telaah sistematik: Hubungan merokok dan perilaku merokok terhadap kejadian tuberkulosis paru. *J Ilm PANNMED*. 2020;15(2):206-10.
3. Jones S. World Heading for Catastrophe Over Natural Disasters, Risk Expert Warns; 2016. Available from: <https://www.theguardian.com/global-development/2016/apr/24/world-heading-for-catastrophe-over-natural-disasters-risk-expert-warns> [Last accessed on 2020 Dec 20].

4. Shukla J. Extreme Weather Events and Mental Health: Tackling the Psychosocial Challenge. New Delhi: ISRN Public Health; 2013.
5. Petkova EP, Schlegelmilch J, Sury J, Chandler TE, Herrera CD, Bhaskar S, et al. The American Preparedness Project: Where the US Public Stands in 2015. New York: National Center for Disaster Preparedness; 2016. p. 2.
6. Miller C. Most Americans Unprepared for Disasters According to a February Persuadable Research Survey. PR WEB. Available from: <https://www.prweb.com/releases/disaster-preparedness/market-research-2012/prweb9225008.htm> [Last accessed on 2020 Dec 20].
7. Donahue AK, Eckel CC, Wilson RK. Ready or Not? How Citizens and Public Officials Perceive Risk and Preparedness. *Am Rev Public Adm.* 2013;44(4):89S-111. <https://doi.org/10.1177/0275074013506517>
8. Solberg C, Rossetto T, Joffe H. The social psychology of seismic hazard adjustment: Re-evaluating the international literature. *Nat Hazards Earth Syst Sci.* 2010;10:1663-77.
9. Mishra S, Suar D. Effects of anxiety, disaster education, and resources on disaster preparedness behavior. *J Appl Soc Psychol.* 2012;42(5):1069-87.
10. James L. A Pilot Assessment of Psychological Factors Associated with Hurricane Sandy Preparedness in Post-Earthquake Haiti. Natural Hazards Center; 2014. Available from: <https://www.hazards.colorado.edu/quick-response-report/a-pilot-assessment-of-psychological-factors-associated-with-hurricane-sandy-preparedness-in-post-earthquake-haiti> [Last accessed on 2020 Dec 20].
11. Allen KM. Community-based disaster preparedness and climate adaptation: Local capacity-building in the Philippines. *Disasters.* 2006;30(1):81-101. <https://doi.org/10.1111/j.1467-9523.2006.00308.x>
PMid:16512863
12. Benson C, Twigg J, Myers M. NGO initiatives in risk reduction: An overview. *Disasters.* 2001;25:199-215. <https://doi.org/10.1111/1467-7717.00172>
PMid:11570334
13. Turoff M, Chumer M, Walle B, Yao X. The design of a dynamic emergency response management information system. *J Inf Technol Theory Appl.* 2004;5:1-36.
14. Acharya L, Upadhyia KD, Kortmann F. Mental health and psychosocial support aspects in disaster preparedness: Nepal. *Int Rev Psychiatry.* 2006;18(6):587-92. <https://doi.org/10.1080/09540260601038407>
PMid:17162702
15. Yang Y, Xiao LD, Arbon P. Chinese nurses' experience in the Wenchuan earthquake relief. *Int Nurs Rev.* 2010;57:217-23. <https://doi.org/10.1111/j.1466-7657.2009.00795.x>
PMid:20579157
16. Olson DK, Scheller A, Larson S, Lindeke L, Edwardson S. Using gaming simulation to evaluate bioterrorism and emergency readiness education. *Public Health Rep.* 2010;125(3):468-77. <https://doi.org/10.1177/003335491012500316>
PMid:20433042
17. Whittemore R, Knafl K. The integrative review: Updated methodology. *J Adv Nurs.* 2005;52(5):546-53. <https://doi.org/10.1111/j.1365-2648.2005.03621.x>
PMid:16268861
18. Kumar R. Research Methodology: A Step-by-Step Guide for Beginners 4th ed. United States: In Sage Publications; 2020.
19. Pace R, Pluye P, Bartlett G, Macaulay AC, Salsberg J, Jagosh J, et al. Testing the reliability and efficiency of the pilot mixed methods appraisal tool (MMAT) for systematic mixed studies review. *Int J Nurs Stud.* 2012;49(1):47-53. <https://doi.org/10.1016/j.ijnurstu.2011.07.002>
PMid:21835406
20. Ardalan A, Mowafi H, Ardakani HM, Abolhasanai F, Zanganeh AM, Safizadeh H, et al. Effectiveness of a primary health care program on urban and rural community disaster preparedness, islamic republic of Iran: A community intervention trial. *Disaster Med Public Health Prep.* 2013;7(5):481-90. <https://doi.org/10.1017/dmp.2013.93>
PMid:24274128
21. Glik DC, Eisenman DP, Zhou Q, Tseng CH, Asch SM. Using the precaution adoption Process model to describe a disaster preparedness intervention among low-income Latinos. *Health Educ Res.* 2014;29(2):272-83. <https://doi.org/10.1093/her/cyt109>
PMid:24399266
22. Paul SA. Assessment of critical thinking: A Delphi study. *Nurse Educ Today.* 2014;34(11):1357-60. <https://doi.org/10.1016/j.nedt.2014.03.008>
PMid:24713126
23. Cha BS, Lawrence RI, Bliss JC, Wells KB, Chandra A, Eisenman DP. The road to resilience: Insights on training community coalitions in the Los Angeles County community disaster resilience project. *Disaster Med Public Health Prep.* 2016;10(6):812-21. <https://doi.org/10.1017/dmp.2016.46>
PMid:27510995
24. Bromley E, Eisenman DP, Magana A, Williams M, Kim B, McCreary M, et al. How do communities use a participatory public health approach to build resilience? The Los Angeles county community disaster resilience project. *Int J Environ Res Public Health.* 2017;14(10):1267. <https://doi.org/10.3390/ijerph14101267>
PMid:29065491
25. Levin KL, Berliner M, Merdjanoff A. Disaster planning for vulnerable populations: Leveraging community human service organizations direct service delivery personnel. *J Public Heal Manag Pract.* 2014;20(5):79-82. <https://doi.org/10.1097/PHH.0000000000000096>
PMid:25072496
26. Muller VM, Burke RV, Berg BM, Lin AC, Upperman JS. A mixed-methods pilot study of disaster preparedness and resiliency among faith-based organizations. *Prehosp Disaster Med.* 2014;29(2):127-33. <https://doi.org/10.1017/S1049023X14000120>
PMid:24555905
27. Pollock MJ, Wennerstrom A, True G, Everett A, Sugarman O, Haywood C, et al. Preparedness and community resilience in disaster-prone areas: Cross-sectoral collaborations in South Louisiana, 2018. *Am J Public Health.* 2019;109:S309-15.
28. Yasunari T, Nozawa M, Nishio R, Yamamoto A, Takami Y. Development and evaluation of "disaster preparedness" educational programme for pregnant women. *Int Nurs Rev.* 2011;58(3):335-40. <https://doi.org/10.1111/j.1466-7657.2011.00919.x>
PMid:21848780
29. Welton-Mitchell C, James LE, Khanal SN, James AS. An integrated approach to mental health and disaster preparedness: A cluster comparison with earthquake affected communities in Nepal. *BMC Psychiatry.* 2018;18(1):1-14. <https://doi.org/10.1186/s12888-018-1863-z>
PMid:30223822
30. Gamboa-Maldonado T, Marshak HH, Sinclair R, Montgomery S, Dyjack DT. Building capacity for community disaster preparedness: A call for collaboration between public environmental health and emergency preparedness and response programs. *J Environ Health.* 2012;75(2):24-9.
PMid:22984732

31. Nicholls K, Picou SJ, McCord SC. Training community health workers to enhance disaster resilience. *J Public Heal Manag Pract.* 2017;23(6):S78-84. <https://doi.org/10.1097/PHH.0000000000000645>
PMid:28961657
32. Tam G, Chan EY, Liu S. Planning of a health emergency disaster risk management programme for a chinese ethnic minority community. *Int J Environ Res Public Health.* 2019;16(6):1-12.
PMid:30909526
33. James LE, Welton-Mitchell C, Noel JR, James AS. Integrating mental health and disaster preparedness in intervention: A randomized controlled trial with earthquake and flood-affected communities in Haiti. *Psychol Med.* 2019;50(2):342-52. <https://doi.org/10.1017/S0033291719000163>
PMid:30782236

Supplementary Table

Table S1: Searching history for each database

Database	Medline database via OVID (US National Library of Medicine)
Search Terms	disaster training OR disaster planning OR disaster preparedness AND evaluation or outcomes of education AND community
Limitations	Published after January 1st, 2009, review, literature review, data, reference document, peer review, English language
Findings	737
Heading/Keyword Review	675
Abstract Review	530
Studies from all databases for full reading and quality appraisal	55
Total Included in Integrative Review	10
Database	ProQuest Social Sciences Journals
Search Terms	disaster training OR disaster planning OR disaster preparedness AND evaluation or outcomes of education AND community
Limitations	Published after January 1st, 2009, review, literature review, data, reference document, peer review, English language
Findings	351
Heading/Keyword Review	162
Abstract Review	95
Studies from all databases for full reading and quality appraisal	21
Total Included in Integrative Review	4