

Innovative Mental Health Interventions for Disaster Survivors: A Narrative Literature Review

Sona Elsa Sunny^{1*}, Alan Reji¹, Rupsa Karmakar²

ABSTRACT

Background: Disasters, both natural and human-made, have profound effects on mental health, often leading to conditions such as PTSD, anxiety, and depression. Traditional mental health services struggle with accessibility and scalability during crises, highlighting the need for innovative approaches. **Objectives:** This narrative review aimed to examine innovative mental health interventions for disaster survivors, emphasizing scalability, cultural adaptation, and community involvement. **Methods:** A systematic search of literature published between 2018 and 2024 was conducted across databases including PubMed, PsycINFO, ScienceDirect, and Google Scholar. Studies focusing on disaster mental health interventions that addressed scalability, cultural sensitivity, and community engagement were included. **Results:** Key interventions identified included technology-driven solutions (e.g., tele-mental health, mobile applications), community-based models (e.g., Community-Based Rehabilitation), and brief psychological therapies such as adapted Cognitive Behavioural Therapy and Psychological First Aid. Socio-ecological strategies fostering resilience and reducing stigma were also noted. **Conclusion:** Innovative, multi-modal approaches integrating technology, economic support, and community participation are transforming disaster mental health care. Findings highlight the critical need for culturally sensitive, scalable interventions and underscore the importance of embedding psychological first aid training at all levels of disaster response.

Keywords: *Innovative interventions, Disaster survivors, Psychosocial interventions, Mental health*

Disasters, both natural and manmade, profoundly affect physical and mental health, especially in developing countries where poverty, limited resources, and inadequate infrastructure hamper effective disaster response. The psychological impact on survivors often includes depression, post-traumatic stress disorder (PTSD), anxiety, and other mental health issues, which can persist long after the event. Addressing mental health in disaster contexts is critical for improving recovery, resilience, and overall well-being of affected populations. (Neria, Nandi, & Galea, 2008)

Developing countries like India face unique challenges in disaster management due to resource constraints and a shortage of trained mental health professionals. Studies have

¹M.Sc. Student, Department of Clinical Psychology, Yenepoya (Deemed to be University), Bangalore

²Assistant Professor, Department of Clinical Psychology, Yenepoya (Deemed to be University), Bangalore

*Corresponding Author

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documented high prevalence of mental health problems among disaster survivors, with risk factors such as age, low education, physical illness, and loss of family members exacerbating vulnerability. For example, the 2013 Uttarakhand disaster resulted in about 58% of survivors experiencing PTSD, with significant levels of depression, anxiety, and stress reported. (Dutta et al., 2015). Similarly, the 2018 Kerala floods, one of the worst in the state's history, led to widespread displacement and economic loss, prompting innovative disaster management strategies integrating mental health care into primary health services. (Thomas et al., 2019; Kiren et al., 2021).

Despite the high burden of mental health issues following disasters, developing countries struggle to provide adequate mental health services due to limited infrastructure, lack of trained personnel, and insufficient integration of mental health into disaster response frameworks. This gap results in unmet psychosocial needs among survivors, impeding effective recovery and long-term resilience. (Cohen et al., 2001; Jack & Izah, 2024)

While several studies have highlighted the prevalence of mental health disorders post-disaster, there remains a significant gap in scalable, culturally sensitive, and community-based mental health interventions tailored for disaster-affected populations in developing countries. Additionally, there is limited evidence on the effectiveness of integrating mental health services into primary healthcare and leveraging technology for psychosocial support in disaster contexts.

The Kerala floods response showcased the benefits of innovative approaches such as Project PARIRAKSHA, which integrated mental health into primary care, trained personnel in psychosocial support, and used information and communication technologies to enhance disaster relief coordination and community engagement. (Kiran et al., 2020)

India's diverse socio-economic and cultural landscape, combined with frequent climate-related disasters, underscores the necessity for localized, culturally appropriate mental health interventions. The Uttarakhand and Kerala disasters exemplify the varied challenges and opportunities in implementing such strategies in different regional contexts within the country.

This narrative review aims to examine the mental health consequences of disasters in India, analyse innovative interventions and propose integrated, community-driven mental health strategies to improve disaster preparedness, immediate response, and sustainable recovery in developing country settings.

THEORETICAL FRAMEWORK

Disaster mental health has shifted from relief-centered post-disaster management to a holistic, multi-dimensional approach encompassing health promotion, disaster prevention, preparedness, and mitigation. This shift aligns with the '6 R's': Readiness, Response, Relief, Rehabilitation, Recovery, and Resilience (Math, 2015). This can be understood on the basis of six 'R' s such as Readiness (Preparedness), Response (Immediate action), Relief (Sustained rescue work), Rehabilitation (Long term remedial measures using community resources), Recovery (Returning to normalcy) and Resilience (Fostering)

R	Meaning	Intervention
Readiness	Preparedness	Disaster Preparedness Education, SIMEX
Response	Immediate action	Psychological First Aid (PFA)
Relief	Sustained rescue work	Narrative Experiences Online (NEON)
Rehabilitation	Long term remedial measures using community resources	Institutional-Based Rehabilitation (IBR) and Community-Based Rehabilitation (CBR)
Recovery	Returning to normalcy	Grief Counseling for Adults
Resilience	Fostering	Forecast-Based Cash Grant System

INNOVATIVE INTERVENTIONS

- 1. Eye Movement Desensitization and Reprocessing (EMDR)** developed by *Francine Shapiro in 1987* is an effective intervention for psychological distress in survivors of natural disasters. Research consistently shows that EMDR significantly reduces symptoms of PTSD, anxiety, and depression, with some studies reporting clinical improvement after just one session, making it a time- and cost-efficient option. EMDR has been successfully applied in individual and group formats, including early interventions, and is particularly effective in addressing post-traumatic avoidance behaviors and subjective distress related to disaster experiences. These findings support EMDR as a viable and practical treatment for psychological distress following natural disasters.
- 2. The Narrative Experiences Online (NEON)** The NEON Intervention, developed by *Mike Slade and the NEON Study Team between 2018 and 2021* uses recorded recovery narratives and algorithmic recommendations to support mental health recovery, demonstrating improvements in quality of life and meaning for users, and proving to be cost-effective. In disaster response, technologies such as UAVs with advanced algorithms enable accurate detection of life signs and human objects post-disaster, while integrated drone and rover systems equipped with GPS, PIR sensors, and facial recognition accelerate victim recovery. The Disaster Logic Model (DLM) offers a structured framework for evaluating the effectiveness of disaster interventions across all response phases. Collectively, these studies highlight the growing impact of technology-driven solutions in enhancing disaster response and victim recovery.
- 3. Forecast-Based Cash Grant System** The forecast-based cash grant system, developed by *the German Red Cross and the Red Cross Climate Centre around 2014–2015*, provides financial assistance to vulnerable households based on weather forecasts, specifically before expected disasters like floods. This system aims to empower beneficiaries to take early actions to protect their health, assets, and livelihoods during extreme weather events. By distributing cash grants in advance, the intervention helps improve food access, reduce debt, and alleviate stress among affected communities.
- 4. Institutional-Based Rehabilitation (IBR):** Institutional-Based Rehabilitation (IBR) evolved from traditional clinical care models during the post-World War II era (1940s–1950s) and has since been adapted to disaster contexts, guided by frameworks developed by *WHO and the United Nations, particularly after major disasters like the 2004 tsunami*.
Modern rehabilitation practices in disaster contexts have evolved beyond traditional clinical care, embracing community-based, survivor-centered models. Community-

Based Rehabilitation (CBR) and Institutional-Based Rehabilitation (IBR) focus not only on physical recovery but also on psychosocial support, social reintegration, and livelihood restoration. Innovations such as tele-rehabilitation, participatory recovery planning, and integration of mental health services within rehabilitation programs highlight a shift toward holistic, accessible, and scalable approaches. These models empower survivors by fostering independence, community participation, and long-term resilience, marking a significant advancement in disaster recovery efforts.

5. **Community-Based Rehabilitation (CBR):** Community-Based Rehabilitation (CBR), launched by the *World Health Organization in 1978*, focuses on integrating individuals back into their communities after the institutional rehabilitation phase. This phase focused on integrating individuals back into their communities and promoting participation in daily life. CBR often involves localized support, training relatives and community members, and creating an environment conducive to rehabilitation and social inclusion.
6. **SALT-Based Psychosocial Interventions:** A study published in *The Indian Journal of Social Work* examined the impact of the SALT (Support, Appreciate, Listen, Team) approach during the 2018 Kerala floods. It found that such interventions fostered mutual care, realization of inner strengths, and enhanced community cohesion among both volunteers and affected individuals. (Zachariah et al., 2023)
7. **SIMEX, or Simulation Exercise,** developed by the *World Health Organization (WHO) in the early 2000s* and formalized under the International Health Regulations in 2005, is a tool developed to enhance countries' preparedness and response to health emergencies. By simulating various crisis scenarios, SIMEX helps assess and strengthen emergency systems, procedures, and coordination among stakeholders. These exercises identify gaps in response strategies, improve communication, and validate disaster response plans, ensuring interventions are practical and effective during real emergencies. SIMEX includes different formats-such as table-top exercises, drills, functional, and full-scale exercises-each designed to test and refine specific aspects of public health emergency management.
8. **Disaster Preparedness Education** Following major disasters like the 2004 Indian Ocean tsunami, *UNESCO and UNICEF* advocated for the integration of disaster preparedness education into the secondary school curriculum, formalized under the Hyogo Framework for Action (2005–2015). This educational intervention aims to better prepare societies for future disasters by teaching disaster risk reduction principles from an early age. Tailored programs, particularly targeting under-resourced schools, focus on equipping vulnerable populations with life-saving knowledge and coping strategies.
9. **Psychological First Aid (PFA)** Psychological First Aid (PFA) is a supportive, evidence-based approach formalized by *WHO, World Vision, and the War Trauma Foundation in 2009*. Initially conceptualized by scholars like Charles Figley, PFA focuses on reducing immediate distress and promoting adaptive coping among disaster-affected individuals. Delivered by trained responders, PFA emphasizes safety, comfort, compassionate listening, needs assessment, and linking people to social and practical support, without forcing discussions of trauma. It fosters resilience and prevents the development of long-term mental health issues
10. **Grief Counseling:** Grief counseling for adults draws from established grief models, such as *Robert Neimeyer's Meaning Reconstruction (1990s)* and *Katherine Shear's Complicated Grief Treatment (early 2000s)*. During the COVID-19 pandemic (2020–2021), specialized grief counseling programs were developed to support bereaved individuals online. These programs, typically consisting of 8 to 10

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one-hour sessions, utilize techniques from cognitive-behavioral therapy for complicated grief (CBT-CG) and meaning reconstruction to promote better life adaptation after loss.

METHODOLOGY

This narrative literature review employed a structured and systematic approach to explore innovative mental health interventions for disaster survivors. A total of 26 studies were reviewed, 14 were included that provided key background information. Electronic databases such as Scopus, PubMed, and Google Scholar were searched using terms like *disaster survivors*, *innovative interventions*, and *mental health*. Reference lists of relevant articles were also examined to ensure comprehensive coverage.

Inclusion criteria focused on peer-reviewed articles published in the last 10 years that addressed innovative mental health interventions for disaster survivors. Studies unrelated to this focus were excluded. As this review used only secondary data, no direct ethical approval was required; however, all original findings were accurately reported and appropriately cited.

Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Timeline	2014 - 2024	<2014
Document types	Journal (research articles)	Non-research papers, non-English papers
Subject area	Psychology & Mental Health (Disaster mental health interventions)	Other than Psychology & Mental Health, Disaster mental health interventions
Language	English	Non- English
Sample	Disaster-affected populations (Adults, adolescents, community member)	Non-Disaster-affected populations (Adults, adolescents, community member)

Table 1: Overview of Studies

Author And Year	Study Design	Country
1. (Lopez,2023)	Qualitative Case Study	USA
2. (Annett Lotzin,2023)	Systematic Review	NA
3. (A. Saltini, 2018)	Retrospective Review	Italy
4. (Rennick-Egglestone,2020)	Developmental and methodological research study.	NA
5.(M. Bailey,2019)	Quasi-experimental	Bangladesh
6. (B. Amatya, 2023)	Literature review	NA
7. (Dziruni, 2018)	Qualitative Study	Zimbabwe
8. (Sharon White-Lewis, 2021)	Quasi-experimental study	USA
9. (S. Mahdi, 2023)	Systematic Review	NA
10. (J. Lating,2021)	Systematic Review	NA
11. (A. Pandya ,2020)	Systematic Review	NA
12. (U. K. Panda,2024)	Narrative review	India
13. (R. Sutar, 2022)	Scoping Review	India
14.(Kessel et al., 2014)	Systematic Review	NA

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SI no	Name of the Paper / Country	Author/Year	Study Design	Innovative Interventions
1.	Sociotechnical system design to support disaster intervention development teams USA	Kaitlyn L. Hale-Lopez, M. Goldstein, Abigail R. Wooldridge 2023	Qualitative Case Study	Diagnostic Testing System: Developed by the Disaster Intervention Development Team during COVID-19 using an agile approach. They rapidly adapted existing technologies and methods to create effective, timely solutions for emerging needs.
2.	Promoting Recovery from Disasters, Pandemics, and Trauma: A Systematic Review of Brief Psychological Interventions to Reduce Distress in Adults, Children, and Adolescents. NA	Annett Lotzin, Alicia Franc de Pommereau, Isabelle Laskowsky 2023	Systematic Review	Self-Help and Psychosocial Interventions: Pandemic-focused tools include <i>My Health Too</i> , a seven-session CBT-based online self-help program with optional therapist support. <i>Bounce Back Now (BBN)</i> offers a four-session web-based self-help program for disaster-affected adolescents and parents. Psychosocial support programs, like grief counseling for adults, promote adaptation and recovery after loss.
3.	Early Eye Movement Desensitisation and Reprocessing (EMDR) intervention in a disaster mental health care context. Italy	A. Saltini, D. Rebecchi, C. Callerame, I. Fernández, E. Bergonzini, F. Starace 2018	Retrospective Review	EMDR is a viable treatment option for reducing psychological distress in disaster victims when provided within three months of the traumatic event.
4.	Recorded Mental Health Recovery Narratives as a Resource for People Affected by Mental Health Problems: Development of the Narrative Experiences Online (NEON) Intervention NA	M. Slade, S. Rennick-Egglestone, 2020	Developmental and methodological research study.	NEON Intervention: A fully online program offering informal carers access to diverse recorded mental health recovery narratives, providing support without face-to-face contact.

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5.	Household-level effects of providing forecast-based cash in anticipation of extreme weather events: Quasi-experimental evidence from humanitarian interventions in the 2017 floods in Bangladesh	C. Gros, M. Bailey 2019	Quasi-experimental	Forecast-based cash grants provided to vulnerable households before a flood in Bangladesh helped improve food access, reduce debt, and lower psychosocial stress.
6.	Disaster Response and Management: The Integral Role of Rehabilitation NA	B. Amatya, F. Khan 2023	Literature review	<ul style="list-style-type: none"> • Integrated Community-Based Rehabilitation (ICBR) • Tele-rehabilitation: • Psychosocial Support Programs • Mobile Health Units (MHUs): • Participatory Recovery Planning: • Resilience Training Programs:
7.	The effectiveness of community-based rehabilitation as a strategy for improving quality of life and disaster resilience for children with disability in rural Zimbabwe	P. P. Bongo, Gladys Dziruni, Chipso Muzenda-Mudavanhu 2018	Qualitative Study	Community-Based Rehabilitation (CBR) Intervention The CBR project aims to empower children with disabilities and their families by enhancing their access to resources and social services.
8.	Improved Knowledge of Disaster Preparedness in Underrepresented Secondary Students: A Quasi-Experimental Study. USA	Sharon White-Lewis 2021	Quasi-experimental study	Targeted Education for Disaster Preparedness The study concluded that the education intervention was effective and cost-efficient, highlighting the need for disaster preparedness education to be incorporated into the secondary school curriculum.
9.	Systematic review on the current state of disaster preparation Simulation	S. Mahdi 2023	Systematic Review	SIMEX <ul style="list-style-type: none"> • Tabletop Exercises: Typically involve a group discussion around a simulated emergency scenario.

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	Exercises (SimEx) NA			<ul style="list-style-type: none"> • Functional Exercises: Participants practice their roles and responsibilities while reacting to simulated incidents. Helps to identify gaps in procedures and communication. • Full-Scale Exercises: These are comprehensive, multi-agency drills that mimic real-life emergencies with the involvement of actual first responders and equipment.
10.	Psychological first aid (PFA) and disasters NA	G. Everly, J. Lating 2021	Systematic Review	<p>Psychological First Aid (PFA) PFA is a specific intervention designed to assess and mitigate acute psychological distress among disaster survivors and responders. Implementation: It can be used by mental health clinicians and peer responders, making it accessible and scalable across different scenarios. Purpose: PFA facilitates psychological triage, allowing responders to prioritize and address the immediate mental health needs of individuals affected by the disaster.</p>
11.	Innovative mental health initiatives in India: A scope for strengthening primary healthcare services NA	A. Pandya, K. Shah, A. Chauhan, Somen Saha 2020	Systematic Review	<ul style="list-style-type: none"> • Quality improvement mental health programs, community-based mental health programs, • non-specialist mental health programs, • mobile-technology based mental health programs tele-mental health programs.
12.	Mental health on the frontlines: Disaster psychiatry perspectives from Odisha U. K. Panda, Jigyansalpsita	U. K. Panda, Jigyansalpsita Pattnaik, Swayanka Samantray, J. Ravan 2024	Narrative review	<ul style="list-style-type: none"> • Skills building • Communal practices • Cooperative livelihood programs • Clinical therapies • Addressing healthcare disparities • Culturally sensitive

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	Pattnaik, Swayanka Samantray, J. Ravan India			mental health care
13	Disaster and Mental Health Preparedness in India: A Scoping Review India	R. Sutar, A. Majumdar, S. Amudhan, P. Satpathy, Vijender Singh 2022	Scoping Review	<ul style="list-style-type: none"> • Integrating Mental Health into Disaster Risk Reduction (DRR) • Community-Based Approaches • Telepsychiatry and Digital Interventions • Training Programs for Healthcare Worker • Collaborative Models • Resilience Promotion Programs • Research and Policy Advocacy
14.	Resilience—Rhetoric to Reality: A Systematic Review of Intervention Studies After Disasters NA	Gisela van Kessel, C. MacDougall, L. Gibbs 2014	Systematic Review	<ul style="list-style-type: none"> • Promoting social interactions to strengthen community support networks. • Developing community competence for better risk assessment and adaptation.

RESEARCH GAPS

Gap Identified	Type of Research Gap	Context
Lack of culturally adapted interventions	Practical Knowledge Gap	Interventions are not well- suited for diverse, non-western populations, due to cultural mismatch.
Limited focus on marginalized populations	Knowledge Gap	Lack of understanding and practical intervention for vulnerable or overlooked groups.
Absence of long-term outcome studies	Evidence Gap / Empirical Gap	There is insufficient empirical evidence on the sustained impact of the interventions.
Limited use of technology in low-resource settings	Practical Knowledge Gap	While tech-based interventions exist, their practical implementation in poor areas is lacking.
Lack of participatory/co-designed interventions	Methodological Gap	Few studies use participatory methods, limiting contextual validity and local engagement.
Focus on individual-level rather than community/system-level interventions	Theoretical Gap	The theoretical framing is too narrow; it overlooks collective/community-based resilience models.
Absence of evidence related to the interventions targeting the resilience of adults.	Evidence Gap	This systematic review highlighted a gap in the evidence relating to interventions targeting the resilience of adults who have experienced a disaster.

RESULTS

A review of 14 studies conducted between 2014 and 2024 reveals a wide range of innovative, evidence-based interventions aimed at enhancing disaster preparedness and promoting mental health recovery across diverse populations. These interventions can be categorized as follows:

2014–2017: Foundational Phase of Innovation

- Psychosocial support, community mobilization, and basic preparedness education started gaining attention, though formal evaluations were fewer.

2018–2020: Early Innovations

- **Community-Based Approaches:** Early studies during this period emphasized community-driven interventions such as Community-Based Rehabilitation (CBR) and Integrated Community-Based Rehabilitation (ICBR), particularly in low-resource settings like Zimbabwe. These programs empowered marginalized groups, including children with disabilities and disaster-affected families, by fostering local participation and resilience. (Bongo, Dziruni, & Muzenda-Mudavanhu, 2018; Amatya & Khan, 2023)
- **Education and Preparedness Programs:** Disaster preparedness education was integrated into curricula for underrepresented secondary students and healthcare professionals, significantly improving knowledge and response capabilities. These foundational efforts laid the groundwork for more specialized and scalable interventions. (White-Lewis et al., 2021).

2020–2022: Rapid Adaptation During the COVID-19 Pandemic

- **Technology-Based Interventions:** The onset of the COVID-19 pandemic accelerated the adoption of digital solutions. Online platforms, mobile health applications, and tele-rehabilitation services (e.g. NEON, tele-mental health) became essential for delivering psychological support with minimal in-person contact. (Slade & Rennick-Egglestone, 2020; Pandya et al., 2020). These interventions ensured continuity of care amid lockdowns and mobility restrictions, with user-informed designs (such as NEON and Bounce Back Now) enhancing engagement and relevance. (Lotzin et al., 2023).
- **Psychological Interventions:** Evidence emerged supporting the effectiveness of early Eye Movement Desensitization and Reprocessing (EMDR), Psychological First Aid (PFA), and brief Cognitive Behavioral Therapy (CBT)-based self-help tools. (Saltini et al., 2018; Everly & Lating, 2021; Lotzin et al., 2023). These approaches were deployed to reduce post-disaster distress among adults, adolescents, and caregivers, with a focus on accessibility and early intervention.

2022–2024: Proactive Strategies

- **Forecast-Based and Economic Interventions:** Studies from this period highlighted the value of proactive, economic support, such as pre-disaster cash transfers in Bangladesh. These forecast-based interventions improved food security, reduced household debt, and decreased psychological stress, demonstrating the benefits of integrating economic resilience into disaster preparedness. (Gros et al., 2019).
- **Simulation and Training Exercises:** Agencies increasingly adopted simulation-based disaster preparedness training-including tabletop, functional, and full-scale exercises-to identify gaps in emergency response protocols and enhance readiness.

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These exercises contributed to capacity building and inter-agency coordination. (Mahdi & Lee, 2023).

- **Multi-Modal and Scalable Approaches:** Recent trends point toward integrated interventions that blend technology, community participation, and psychological support. These multi-modal strategies aim to build both individual and collective resilience, with a particular emphasis on inclusivity and scalability for underserved populations. (Sutar et al., 2022).

DISCUSSION

This narrative review highlights a paradigm shift in disaster mental health interventions. Unlike earlier models focused solely on post-disaster relief, current approaches integrate proactive strategies, community-based support, and technology-driven solutions. Telemental health platforms, mobile applications, and online self-help programs have significantly enhanced service accessibility, particularly during crises like the COVID-19 pandemic.

Community-based rehabilitation programs and forecast-based cash transfer systems further illustrate the move toward holistic recovery models that address both psychological and socioeconomic needs. Psychological First Aid (PFA) and adapted Cognitive Behavioral Therapy (CBT) interventions emphasize early, scalable responses to psychological distress. Despite progress, key gaps remain. Many interventions lack cultural adaptation, have limited long-term follow-up, or are inaccessible to marginalized populations. Technology-based solutions, though promising, risk excluding low-resource communities.

Future efforts must prioritize inclusive, culturally sensitive designs and embed Psychological First Aid training across sectors. Integrating mental health into broader disaster preparedness frameworks will be crucial to strengthening resilience at both individual and community levels. Building resilient systems today paves the way for a more compassionate and prepared world tomorrow.

Limitations

1. Interventions are often specific to certain countries or cultural contexts, making it difficult to apply them universally without modifications.
2. Most studies evaluate immediate outcomes, with limited data on long-term mental health or resilience impacts.
3. Technology-based interventions may not reach people in low-resource or rural areas lacking internet access or digital literacy.
4. Some studies lack rigorous research designs (e.g., control groups, longitudinal studies), reducing confidence in results.
5. Groups like the elderly, LGBTQIA+ individuals, indigenous communities, and those with severe mental illness are often overlooked.
6. Literacy-dependent or language-specific tools may exclude non-literate or linguistically diverse populations.
7. High-cost or resource-intensive interventions may not be feasible in low-income settings or during widespread crises.

CONCLUSION

This review highlights the emergence of multi-modal, scalable interventions that integrate technology, community engagement, psychological support, and proactive planning—an

approach not previously emphasized in disaster mental health literature. The findings demonstrate that these innovative, integrated interventions are transforming disaster response and mental health recovery. By prioritizing accessibility, cultural sensitivity, and scalability, these approaches address the diverse needs of disaster survivors and enhance collective resilience.

To maximize their impact, embedding Psychological First Aid as core training for frontline responders is essential, as is fostering collaboration between governments, NGOs, community leaders, and mental health professionals. Continued research and adaptation will ensure that no community is left behind, paving the way for more effective, compassionate, and sustainable disaster preparedness systems. Further exploration of the long-term effects of these interventions, the role of policy, and the integration of technological innovations will continue to drive improvements in disaster resilience. Moreover, prioritizing the needs of vulnerable populations, such as children and individuals with disabilities, remains crucial to ensuring equitable access to disaster recovery resources.

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Conflict of Interest

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