Research Article

Disaster Preparedness among Vulnerable Groups: A Literature Review

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Abstract

Background: Indonesia is among the countries with the highest levels of disaster threat in the world owing to its position at the meeting point of tectonic plates and along the Pacific Ring of Fire. In every disaster, vulnerable groups—older people, persons with disabilities, children, pregnant and lactating women, and individuals with chronic illness—are consistently the most affected yet the least represented in preparedness planning. **Objective:** This literature review aims to synthesise evidence on disaster preparedness among vulnerable groups, its determinants and barriers, relevant policy frameworks, and implications for nursing and community practice. **Methods:** A narrative review of national and international literature published between 2011 and 2026, searched through academic databases using combined keywords relating to disaster preparedness and vulnerable groups. **Results:** The literature indicates that vulnerability is not a fixed attribute but a condition shaped by the interaction of individual characteristics, socio-economic context, and disaster phase. Vulnerable groups tend to report lower household preparedness, barriers to accessing early-warning information and evacuation, and special needs that are frequently overlooked. Community-based education and empowerment interventions are shown to improve preparedness knowledge and skills. **Conclusion:** An inclusive, participatory, and disaggregated-data-based approach to preparedness is needed so that no group is left behind. Nurses and health workers hold a strategic role as educators, facilitators, and advocates.

Keywords: Disaster preparedness; vulnerable groups; social vulnerability; disability-inclusive disaster risk reduction; disaster nursing

Background

Indonesia lies at the meeting point of three major tectonic plates and sits along the Pacific Ring of Fire, exposing it to almost every type of hazard—from earthquakes, tsunamis, and volcanic eruptions to hydrometeorological disasters such as floods and landslides. West Sumatra, including the city of Padang and its coastal areas, is one of the regions with high earthquake and tsunami risk. This geographical reality makes disaster preparedness a fundamental need for all segments of society.

Although disasters can strike anyone, their impacts are never distributed evenly. Certain groups face far greater risk because of limited physical, cognitive, social, or economic capacity to anticipate, cope with, and recover from disaster events. In the literature and in regulations, these are referred to as vulnerable groups. In the Indonesian disaster context, vulnerable groups generally include older people (the elderly), persons with disabilities, children, pregnant and lactating women, and individuals with chronic illness or special medical conditions.

The National Disaster Management Agency (BNPB) affirms that vulnerable groups are frequently the most affected victims, so that improving their preparedness is an urgent imperative that must involve all elements—government, volunteers, disaster risk reduction forums, and communities themselves (BNPB, 2023). However, preparedness efforts to date have too often positioned vulnerable groups merely as recipients of assistance rather than as actors actively involved in planning (ministries/disability organizations, in Liputan6, 2022).

The gap between the high risk faced by vulnerable groups and their minimal involvement in preparedness systems calls for a comprehensive synthesis of evidence. This literature review was prepared to: (1) explain the concept of vulnerability and vulnerable groups in disasters; (2) map the findings on preparedness within each vulnerable subgroup; (3) identify the determinants of and barriers to preparedness; (4) examine relevant inclusive policy frameworks; and (5) formulate implications for nursing practice and community empowerment.

Method

This study used a narrative literature review approach to synthesise evidence across diverse disciplines—nursing, public health, disaster management, sociology, and public policy. Searches were conducted in academic databases and trusted institutional sources, including PubMed/PMC, ScienceDirect, and national journal repositories, as well as documents from institutions such as UNDRR, BNPB, and civil-society organizations working in the disaster field.

The keyword combinations used included “disaster preparedness,” “vulnerable populations/groups,” “older people/elderly,” “persons with disabilities,” “children/school,” “pregnant women,” and “medically vulnerable,” together with their Indonesian equivalents “kesiapsiagaan bencana,” “kelompok rentan,” “lansia,” “disabilitas,” “ibu hamil,” and “kerentanan sosial.” The literature included was limited to Indonesian- and English-language publications from 2011 to 2026 relevant to the preparedness (pre-disaster) phase, whether systematic reviews, empirical studies, or policy reports. Sources that could not be fully accessed or were not relevant to the theme of preparedness among vulnerable groups were excluded from the analysis.

Findings from the selected literature were analysed thematically: grouped by type of vulnerable group, determinants, barriers, and intervention strategies, and then synthesised to identify patterns, trends, and knowledge gaps that were consistent across sources.

Results and Discussion

3.1 The Concept of Vulnerability and Vulnerable Groups in Disasters

The literature consistently emphasises that vulnerability is not a characteristic permanently inherent in an individual or group, but rather a fluid condition determined by time, hazard type, circumstances, and access to various forms of capital—physical, social, and economic (National Center for Disaster Preparedness, 2024). A person may be highly

vulnerable to one type of hazard at a particular phase yet relatively resilient in another situation. Vulnerability is therefore more accurately understood as the product of the interaction between individual characteristics and social, economic, and environmental determinants.

Groups generally categorised as vulnerable include older people, children, the poor, those who are socially and physically isolated, persons with disabilities, and ethnic minorities (Australian Journal of Emergency Management, 2012). In the Indonesian context, BNPB and local governments add pregnant and lactating women as groups requiring special attention (BNPB, 2023; BPBD Bandung Regency, 2025). Importantly, different categories of vulnerability often overlap (intersectionality): a girl with a disability from a poor family faces compounded risk far greater than the simple sum of each individual factor (PMC, 2020).

3.2 Disaster Preparedness among Older People (the Elderly)

Older people are widely regarded as vulnerable across all disaster phases—from preparedness and response to recovery—chiefly because of declining physical and cognitive capacity that makes it difficult for them to escape or evacuate independently (Johorejo Desa, n.d.; Nofita, 2022). A case study in RW 14 Pasie Nan Tigo, Padang, confirms that family preparedness is key, since families play a role in guiding the evacuation of their elderly members (Nofita, 2022).

International literature reviews reveal a pattern that is both striking and problematic: older people are among the most vulnerable populations, tend to be less prepared even when resources are available, and often prioritise the preparedness of family or relatives before their own (PMC, 2019). Preparedness behaviour among older people is viewed as a function of vulnerability and resilience—negatively associated with vulnerability and positively associated with resilience. This finding opens an opportunity for intervention: positively framed preparedness messages may be more effective in motivating older people than threat-based messages that emphasise fear (PMC, 2019).

At the practice level, community-based urban disaster management programmes for vulnerable groups and older people have been run by several organizations, covering the fundamentals of community disaster management, early-warning systems, light firefighting, and evacuation, with the aim of enabling older people to save themselves until help arrives (Disaster Management Center Dompet Dhuafa, 2022).

3.3 Disaster Preparedness among Persons with Disabilities

Persons with disabilities are among the groups most disproportionately affected by disasters and have uneven levels of resilience and recovery capacity. Many are socially and logistically isolated and lack access to evacuation warnings and suitable transportation, including for the carers and medical equipment they require (UNDRR, 2025). About 15% of the world's population lives with some form of impairment, and this proportion is projected to rise with population ageing and with disasters themselves, which can increase the number of persons with disabilities in affected communities (Grossi, 2023).

Concrete barriers in Indonesia include disaster-response infrastructure that is not yet disability-friendly: evacuation routes that are steep and inaccessible to wheelchairs, and early-warning information that remains predominantly audio-based without visual alternatives for deaf persons (BNPB, 2025). The principle "nothing about us without us" affirms that persons with disabilities are not merely victims but actors possessing disaster knowledge; many disability organizations are now actively delivering preparedness training and even training search-and-rescue (SAR) teams to understand the evacuation needs of persons with disabilities (BNPB, 2025).

Empowerment models such as Difabel Siaga Bencana (Difagana, "Disaster-Ready Persons with Disabilities") show that strengthening the capacity of persons with disabilities must take into account the characteristics of each type of disability and build two core elements simultaneously: individual competence and access to various

forms of social capital (Jurnal IAIN Salatiga, 2019). Inclusive programmes such as PIONEER in Central Sulawesi emphasise involving disability and elderly organizations not only as beneficiaries but also as actors in humanitarian activities (Liputan6, 2022).

3.4 Disaster Preparedness among Children and in School Settings

Children are one of the most vulnerable groups during and after disasters. Disasters can directly harm children's physical and mental health, disrupt educational infrastructure and processes, and produce indirect impacts that may last a lifetime, including increased risks of violence, child trafficking, school dropout, and early marriage in post-disaster situations (PMC, 2020). Even so, children's preparedness is in fact one of the principal solutions for reducing post-disaster losses.

Schools occupy a strategic position in disaster risk reduction: educating learners to recognise risks in their communities, building preparedness, conducting drills, and fostering a culture of prevention (UNDRR, 2024). The knowledge children acquire can spread to their families and surrounding communities, making children effective risk communicators (Tandfonline, 2023). The Hyogo Framework (2005–2015), particularly Priority 3, positioned disaster risk reduction education as a global priority and encouraged its integration into curricula (Frontiers in Sustainability, 2026).

The 2011 Tohoku tsunami tragedy in Japan, which caused heavy casualties among students and teachers, exposed critical gaps in school preparedness and underscored the need to integrate disaster risk reduction into teacher training, curricula, and community-based education (ScienceDirect, 2025). However, the literature also cautions that the assessment of learning outcomes is the least developed element in disaster education, making age-appropriate measurement of programme effectiveness an urgent research need (ScienceDirect, 2014). Promising approaches include the use of storytelling and gamification to transform complex concepts into experiences that are relevant and enjoyable for children (UNDRR, 2024).

3.5 Disaster Preparedness among Pregnant and Lactating Women

Pregnant and lactating women are a group that is especially vulnerable in disasters owing to physiological changes, increased need for health services, and the potential disruption of access to antenatal care and obstetric emergency services. The World Health Organization (WHO) emphasises that disaster preparedness strategies must be implemented specifically for pregnant women in order to reduce adverse maternal and fetal outcomes (BMC Pregnancy and Childbirth, 2026). Unfortunately, in resource-constrained situations, the specific needs of this group are often overlooked because attention is focused on the general population.

Basic needs such as clean water, nutritious food, diapers, and safe sleeping areas become critically important for pregnant and lactating women and infants, yet their availability is frequently disrupted after a disaster (PMC/PRAMS, 2022). Preparedness data reveal a clear gap: only a small proportion of women practise all the recommended preparedness behaviours, with most lacking an evacuation plan or adequate emergency supplies (PMC/PRAMS, 2022).

Beyond the physical dimension, the psychological impact is also significant. A systematic review shows that disasters increase the risk of depression, anxiety, post-traumatic stress disorder (PTSD), and psychological distress in pregnant women, with pregnancy being a uniquely vulnerable period as biological sensitivity meets concern for fetal safety (PMC, 2025). Maternal mental health therefore needs to be integrated into preparedness and response planning. Evidence from a randomised controlled trial shows that structured disaster preparedness training can significantly improve the knowledge and preparedness levels of pregnant women (BMC Pregnancy and Childbirth, 2026).

3.6 Preparedness among Groups with Chronic Medical Conditions

Individuals with poor health, disabilities, and chronic illness are at higher risk of adverse health outcomes from natural disasters. Analysis

based on the Behavioral Risk Factor Surveillance System (BRFSS) survey in the United States found a distinctive pattern: vulnerable populations are generally less likely to have household preparedness supplies (e.g., food, water, flashlight, radio) or an evacuation plan, yet are more likely to have a supply of medication (American Journal of Preventive Medicine, 2011). This finding implies that preparedness interventions need to target the specific gaps in supplies and planning within this group, rather than general education alone.

Functional-needs frameworks such as CMIST—communication, medical care, independence, supervision, and transportation—offer a practical lens for identifying access and functional needs across vulnerable groups, rather than relying only on diagnostic labels (American Journal of Disaster Medicine, 2024). This functional-needs approach makes it easier for planners to design well-targeted support without stigmatising.

3.7 Inclusive Preparedness Policy Frameworks

The Sendai Framework for Disaster Risk Reduction 2015–2030 marks a global shift towards the active and meaningful involvement of vulnerable groups in disaster risk reduction. The framework emphasises a people-centred approach, prevention of the creation of new risk, and all-of-society engagement, with particular attention to those most affected, through the lenses of gender, age, disability, and culture (UNDRR, 2020; International Disability Alliance, n.d.).

Unlike its predecessor, the Hyogo Framework, which barely mentioned persons with disabilities, the Sendai Framework contains direct and indirect references to disability in its preamble, guiding principles, priorities for action, and stakeholder roles (ScienceDirect, 2020). The framework also calls for the exchange and dissemination of data disaggregated by sex, age, and disability as a basis for inclusive policy (UNDRR, 2025), in line with the UN Convention on the Rights of Persons with Disabilities (CRPD) and the principle of Universal Design (CBM Inclusive Participation Toolbox, n.d.).

At the national level, analysis of Indonesia's disaster regulatory frameworks shows that disability has been incorporated as one element of social vulnerability; however, most provisions still position persons with disabilities passively and are not yet fully aligned with the spirit of individual agency and comprehensive involvement championed by Sendai (ScienceDirect, 2020). The implementation gap between policy commitments and field practice is a recurring central challenge in the literature (Grossi, 2023).

3.8 Determinants of and Barriers to Preparedness

A cross-group synthesis reveals a number of recurring determinants of and barriers to preparedness, which can be grouped as follows:

- **Physical and cognitive limitations**—these reduce the capacity for independent evacuation, especially among older people and persons with disabilities (Nofita, 2022; UNDRR, 2025).
- **Barriers to information access**—audio-based early warnings that do not reach deaf persons, and information that is not child-friendly or does not use easily understood formats (BNPB, 2025; BPBD Bandung Regency, 2025).
- **Socio-economic factors**—poverty and limited resources aggravate impacts, particularly for pregnant women and poor families (Direct Relief, 2019).
- **Non-inclusive infrastructure**—evacuation routes and shelters that are not yet accessible to wheelchairs, and a lack of disability-friendly facilities, lactation spaces, and basic health services (BNPB, 2025; BPBD Bandung Regency, 2025).
- **Tokenistic involvement**—vulnerable groups positioned as objects receiving assistance rather than as actors in planning (Liputan6, 2022).
- **Absence of disaggregated data**—this hampers pre-disaster data collection for well-targeted evacuation, sheltering, and aid distribution (UNDRR, 2023; BPBD

Bandung Regency, 2025).

Conversely, protective factors include family preparedness, individual and community resilience, and community-based empowerment programmes that have been shown to significantly improve participants' knowledge and skills (Nofita, 2022; Jurnal Sains dan Aplikasi Masyarakat, 2024).

3.9 Strategies to Enhance Preparedness and the Role of Nurses

The literature points to several complementary strategies. First, data collection on vulnerable groups from the pre-disaster phase as a basis for planning evacuation, sheltering, and aid distribution (BPBD Bandung Regency, 2025). Second, preparedness education that is inclusive and easily understood—using sign language, visualisation, and child-friendly methods. Third, the provision of needs-responsive facilities, such as lactation spaces, disability facilities, basic health services, and systems to protect women and children from violence (BPBD Bandung Regency, 2025). Fourth, the meaningful involvement of vulnerable groups in contingency plans and training, so that systems become more responsive and equitable.

Community-based empowerment has proven effective. A programme in the coastal area of Padang, for example, applied five stages—socialisation and commitment-building, training of prospective mentors, formation of mentor groups, strengthening of mentoring for vulnerable groups, and monitoring and evaluation—and produced significant gains in knowledge and skills (Jurnal Sains dan Aplikasi Masyarakat, 2024).

Nurses occupy a strategic position throughout this entire chain. As health workers close to the community, nurses act as preparedness educators, facilitators of community-based training (including first aid and everyday emergencies), advocates for inclusive policy, and links between the families of vulnerable groups and the service system. This role aligns with the development of emergency and disaster nursing education that emphasises community preparedness. Innovative learning approaches such as simulation and gamification have the potential to strengthen preparedness competence, both for nursing learners and for the vulnerable groups they support (UNDRR, 2024).

4. Conclusion and Recommendations

This literature review affirms that vulnerability in disasters is not a fixed attribute but a dynamic condition shaped by the interaction of individual characteristics, socio-economic context, and disaster phase. Older people, persons with disabilities, children, pregnant and lactating women, and individuals with chronic illness consistently face greater risk together with lower levels of preparedness, chiefly because of limited access to information, non-inclusive infrastructure, and involvement that is not yet meaningful.

Evidence shows that structured educational interventions and community-based empowerment can significantly improve the preparedness knowledge and skills of vulnerable groups. The Sendai Framework and the CRPD provide a normative foundation for inclusive preparedness, although the implementation gap between policy and practice remains a challenge, including in Indonesia.

Several recommendations can be formulated: (1) strengthen disaggregated data collection on vulnerable groups in the pre-disaster phase; (2) develop accessible, well-targeted preparedness education materials and media for each subgroup; (3) provide inclusive shelter infrastructure and facilities; (4) involve vulnerable groups as actors, not merely as beneficiaries; and (5) strengthen the role of nurses and health workers as educators and advocates through evidence-based disaster nursing education. Further research is recommended to develop age- and context-appropriate instruments for measuring programme effectiveness, and to test innovative interventions such as simulation and gamification among vulnerable groups.

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