



Nursing-LED and Nursing Supported Interventions to Enhance Resilience Among Vulnerable Populations in Post-Disaster Settings: A Scoping Review

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ABSTRACT

Introduction: Increasing global disasters due to climate change have caused severe health crises, especially for vulnerable groups like older adults, people with disabilities, and those with chronic diseases. This study was conducted to map nursing interventions designed to enhance the resilience of vulnerable populations. **Methods:** This study used scoping review following Arksey and O'Malley and PRISMA-ScR guidelines. The eligibility were structured using the PCC (Population, Concept, Context) framework. A systematic search was executed for original English articles that published between 2016-2026 and written in English from databases including PubMed, Scopus, and EBSCOhost. Study selection was performed independently by two reviewer, and data extraction utilized a standardized charting form. Methodological quality was evaluated using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists. **Results:** A total of 275 articles were identified from three databases through the literature search. After screening, 15 final articles were included in the current review. The synthesis categorized interventions into two primary domains: (1) Physical Domain, comprising chronic disease management and self-management support, household emergency preparedness, and community healthcare outreach to navigate disaster-affected terrain; and (2) Psychological Domain, encompassing community-based psychosocial and trauma skills programs (e.g., SOLAR, CBDMHI), digital-based psychosocial interventions, and self-efficacy-focused education. Findings indicate that nurses function as critical care coordinators and community mobilizers. However, the synthesis reveals significant evidence gaps regarding the long-term sustainability of these interventions, the limited representation of populations with "layered vulnerabilities," and the need for standardized resilience metrics. **Conclusion:** Nursing-led interventions are paramount for sustainable resilience by integrating physical domain support with psychosocial and digital-based care. These strategies effectively leverage nursing roles as coordinators and community mobilizers, though future efforts must prioritize longitudinal implementation and policy integration to ensure long-term recovery for vulnerable populations

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1. INTRODUCTION

Natural disasters and humanitarian crises have significantly increased in frequency and intensity in recent years, largely driven by global climate change (Beijing Normal University, 2024; Tin et al., 2024). Data from the Emergency Events Database (EM-DAT) indicate that in 2024 alone, approximately 393 major natural disasters occurred, resulting in 16,753 fatalities and affecting 167.2 million people worldwide (Beijing Normal University, 2024; Tin et al., 2024). Regionally, catastrophic events such as the severe floods and landslides in Sumatra in late 2025, which claimed over 1,140 lives and displaced 400,000 residents underscore the profound vulnerability of public health systems in disaster-prone regions (Marthoenis, 2025). These conditions not only inflict extensive physical damage but also precipitate a widespread mental health crisis among survivors.

The ramifications of disasters extend far beyond immediate physical trauma; empirical evidence indicates that at least 22% of populations exposed to conflict or disasters experience mental health disorders, most notably depression, anxiety, and Post-Traumatic Stress Disorder (PTSD) (World Health Organization, 2022). Vulnerable populations specifically the elderly, women, individuals with non-communicable diseases (NCDs), and those experiencing socioeconomic deprivation face disproportionately higher risks of these psychological morbidities (Wiciak et al., 2025). Consequently, fostering resilience the capacity to adapt and recover from traumatic experiences has emerged as a paramount priority within the post-disaster recovery framework (Obuobi-Donkor et al., 2024).

Nursing professionals are integral to every stage of disaster management, spanning from initial preparedness to long-term rehabilitation (Loke & Fung, 2014). Their involvement on the front lines transcends immediate clinical intervention, they function as vital care coordinators, health educators, and psychosocial counselors (Loke & Fung, 2014; Wang et al., 2022). While the International Council of Nurses (ICN) competency standards mandate that nurses provide robust emotional support to bolster survivors' self-efficacy, a significant professional gap remains (Loke & Fung, 2014) Empirical data reveals that approximately 72% of nurses feel inadequately prepared to manage complex trauma in vulnerable populations due to a lack of specialized disaster training (Al Thobaity et al., 2017).

The recent surge in disaster-related research has catalyzed the development of diverse evidence-based interventions spearheaded or mediated by nursing professionals to bolster resilience. For instance, the Skills for Life Adjustment and Resilience (SOLAR) program a brief psychosocial framework has demonstrated significant efficacy in mitigating PTSD symptoms and enhancing social functioning across various global contexts (Cowlshaw et al., 2023a). Similarly, digital innovations, such as the Text4Hope platform and broader telenursing initiatives, have emerged as vital tools for extending accessible care to geographically isolated and vulnerable populations (Obuobi-Donkor et al., 2024). However, despite the proliferation of these strategies, a comprehensive synthesis mapping the specific modalities and mechanisms of nursing-led support for vulnerable groups in the aftermath of disasters remains sparse.

The decision to employ a scoping review methodology is necessitated by the requirement to map the breadth and depth of extant literature regarding heterogeneous nursing led resilience interventions. Existing studies have produced a wide range of psychosocial, digital, and chronic

disease focused strategies implemented by nurses in diverse disaster contexts; however, these interventions remain conceptually fragmented, use inconsistent terminology, and are often reported in isolation, making it difficult to obtain an integrated picture of nurses' specific contributions to post disaster resilience among vulnerable groups. To date, no review has systematically synthesized nursing led or nursing mediated interventions that explicitly target resilience in vulnerable populations (such as older adults, people with non communicable diseases, disabilities, or socioeconomically disadvantaged groups) across different types of disasters, resulting in limited guidance for practice and policy in this area. Given that post disaster recovery is inherently multifaceted encompassing diverse cultural landscapes, varying disaster archetypes (natural versus conflict driven), and rapidly evolving technologies this scoping approach enables the identification of core concepts, the underlying theoretical frameworks (such as the Theory of Caring), and persistent research lacunae that constrain the development of comprehensive, nurse driven resilience building models (Tricco et al., 2018).

While previous reviews have explored general disaster nursing competencies or specific mental health interventions, a systematic synthesis mapping the specific modalities of nursing-led resilience strategies across heterogeneous disaster contexts (including social conflicts and pandemics) for multiple vulnerable groups remains sparse. Consequently, the primary objective of this review is to delineate the landscape of available evidence concerning various resilience-building strategies, either spearheaded or mediated by nursing professionals, specifically tailored for vulnerable populations. The synthesis of these findings is anticipated to yield an evidence-informed framework, providing practitioners and policymakers with the necessary insights to fortify future resilience-building initiatives.

2. METHODS

Research Design

This study was conducted using a scoping review design to map the breadth of evidence regarding nursing interventions for vulnerable populations in post-disaster settings. The review adhered to the methodological framework established by Arksey and O'Malley (2005), executing the following specific stages including formulating the research question, identifying pertinent literature, executing study selection based on predefined criteria, charting the data, and the subsequent collation, synthesis, and reporting of findings complemented by an optional stakeholder consultation. Furthermore, to ensure methodological transparency and structural integrity, this review aligns with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018).

Eligibility Criteria

The formulation of the research question and the selection of literature for this scoping review were guided by the PCC (Population, Concept, and Context) framework. This systematic approach ensures that the evidence mapping remains focused and methodologically rigorous.

P (Population) : Vulnerable groups (consistently defined across this review as older adults, individuals with chronic diseases, people with disabilities)

- C (Concept) : Nursing interventions, Nurse support
C (Context) : Post-disaster resilience

To ensure a rigorous and transparent selection process, specific inclusion and exclusion criteria were established. The inclusion criteria prioritized vulnerable populations, specifically cohorts comprising individuals with chronic morbidities, persons with disabilities, and older adults. Conceptually, the review focused on nursing-led interventions and professional support frameworks facilitated by nursing personnel. Contextually, the inquiry was situated within the framework of patient or survivor resilience in post-disaster settings. Eligible literature was restricted to original research including pilot studies and study protocols published between 2016 and 2026. To mitigate potential inaccuracies during the data extraction phase and ensure linguistic precision, the search was limited to articles published in English. Conversely, secondary literature, such as systematic or scoping reviews, was excluded to maintain a focus on primary evidence. The article was limited to 2016–2026 to obtain evidence that is contemporary and relevant to current nursing practice. The timeframe was deliberately selected to synthesize contemporary evidence reflective of current nursing paradigms and to capture the evolution of disaster-response strategies. This decade encompasses significant global and national catastrophes, most notably the COVID-19 pandemic, which became a focal point of global health management and profoundly impacted various facets of human life. Finally, to ensure the methodological integrity of the included studies, a formal critical appraisal was conducted using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists, allowing for a systematic evaluation of study quality.

Searching Strategy

A comprehensive literature search was executed across four electronic databases including PubMed, Scopus, EBSCOhost, and Cambridge Core. The search strategy utilized predefined keywords, with PubMed searches further refined through Medical Subject Headings (MeSH) terms to ensure thematic precision. The search strings were structured according to the Population, Concept, and Context (PCC) framework, employing Boolean operators (AND, OR) to optimize retrieval sensitivity

Tabel 1. Databases and Keyword

No	Database	Keywords	Articles	Access Date
1	PubMed	(("Aged"[Mesh] OR "Chronic Disease"[Mesh] OR aged[tiab] OR elderly[tiab] OR "older adults"[tiab] "chronic disease*" [tiab] OR "chronic illness*" [tiab] OR "non-communicable disease*" [tiab] OR NCD*[tiab])) AND (("Nursing Care"[Mesh] OR nurse*[tiab] OR "nursing intervention*" [tiab] OR "nursing care" [tiab] OR "nurse support" [tiab] OR "nursing management" [tiab] OR "continuity of care" [tiab])) AND (("Disasters"[Mesh] OR disaster*[tiab] OR "post-disaster" [tiab] OR aftermath[tiab])) AND (("Self-Management"[Mesh] OR resilience[tiab] OR "physical resilience" [tiab] OR "self-management" [tiab] OR "physical recovery" [tiab] OR "medication adherence" [tiab]))	27	22 June 2026
2	Scopus	TITLE-ABS-KEY ((aged OR elderly OR "older adults" OR "chronic disease*" OR "chronic illness*" OR "non-communicable disease*" OR NCD*) AND (nurse* OR "nursing intervention*" OR "nursing care" OR "nurse support" OR "nursing management" OR "continuity of care") AND (disaster* OR "post-disaster" OR aftermath) AND (resilience OR "physical resilience" OR "self-management" OR "physical recovery" OR "medication adherence"))	179	22 June 2026
3	EBSCOhost	aged OR elderly OR "older adults" OR "chronic disease*" OR "chronic illness*" OR "non-communicable disease*" OR NCD* AND nurse* OR "nursing intervention*" OR "nursing care" OR "nurse support" OR "nursing management" OR "continuity of care" AND disaster* OR "post-disaster" OR aftermath AND resilience OR "physical resilience" OR "self-management" OR "physical recovery" OR "medication adherence"	69	22 June 2026
Jumlah			275	22 June 2026

The "Population" component was strategically broadened to "vulnerable groups" following an initial pilot search. This adjustment was made as overly specific population parameters yielded a significantly limited number of articles, thereby increasing the risk of excluding potentially eligible studies. Similarly, the specific "Context" term (e.g., "post-disaster") was omitted from the formal search strings. Preliminary trials demonstrated that incorporating this contextual constraint led to an overly restrictive result set; consequently, the authors decided to evaluate contextual relevance manually during the screening phase to ensure a more exhaustive evidence synthesis.

Study Selection Process

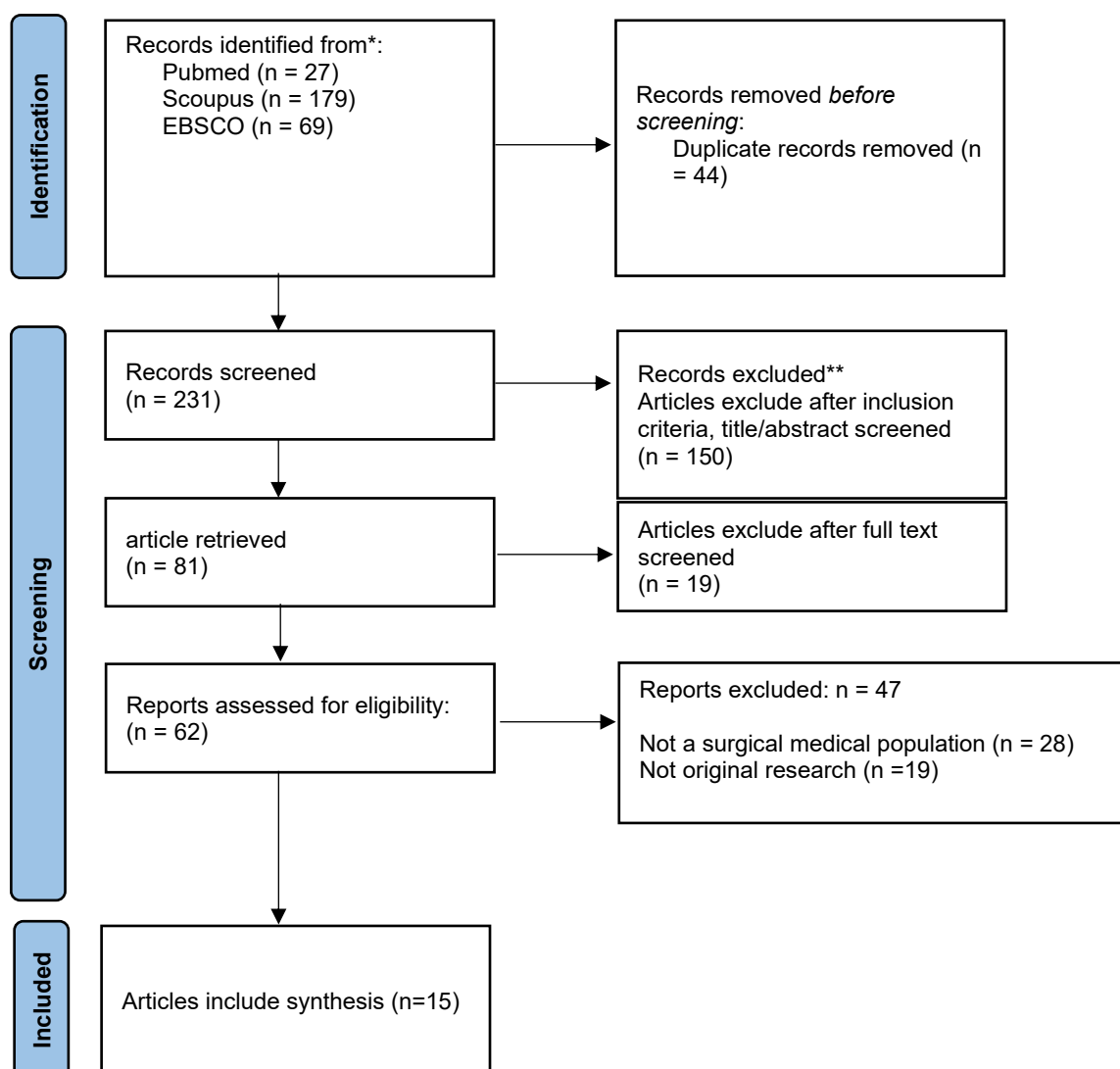
Following the database search, all identified records were exported to a reference management software, and duplicates were removed. The study selection process was conducted in two distinct phases to enhance methodological rigor. First, two independent reviewers (FA and AZP) screened the titles and abstracts of all unique citations against the predefined eligibility criteria. Second, the full texts of potentially relevant articles were retrieved and independently assessed by the same two reviewers. Discrepancies regarding study eligibility were resolved through discussion between the two independent reviewers (FA and AZP). If a consensus was not reached, a third senior reviewer (CEK) acted as an arbiter to make the final determination.

the Joanna Briggs Institute (JBI) Critical Appraisal Checklists were employed to systematically evaluate the methodological quality and potential risk of bias across the included studies, ensuring that the evidence synthesis is grounded in robust research designs, even within the flexible framework of a scoping review

Data Charting Process

Data charting was performed using a standardized extraction form. For empirical studies, the extracted data included author details, year of publication, location, study design, disaster type, targeted vulnerable population characteristics, and main results. Consequently, to map the current trajectory of ongoing research regarding post-disaster resilience strategies, study protocols that did not yet have reported empirical results were also included in this review. For these specific records, the data extraction process was adapted to focus on the proposed methodologies, planned nursing interventions, and intended primary outcomes rather than empirical findings. This approach allows for a more comprehensive identification of research gaps and future directions in nursing-led disaster resilience, ensuring that the evidence synthesis captures both completed empirical studies and emerging research trends.

Diagram 1. PRISMA Flowchart



3. RESULT

A total of 15 articles were identified as meeting the established PCC framework and keyword criteria. These publications were released between 2018 and 2026, representing a diverse geographical spectrum that spans both developed and developing nations. Among these, two studies were specifically conducted in Australia (Cowlshaw et al., 2023b; Mikocka-Walus et al., 2020), six studies were specifically conducted in United State of America (Contreras et al., 2022; Crowley et al., 2025; Heagele et al., 2024; Keegan et al., 2018; Shukla et al., 2024; Wiciak et al., 2025), three studies were specifically conducted in Canada (Belleville et al., 2023a, 2025; Obuobi-Donkor et al., 2024), one study were specifically conducted in Ethiopia (Yigzaw et al., 2023), one study were specifically conducted in South Korea (Choi et al., 2018), one study conducted in China (Xiaolian & Song, 2023), and one study were specifically conducted in South East Asia (including Indonesia, Cambodia and Thailand) (Matthew et al., 2019). The included studies exhibited significant methodological heterogeneity, reflecting a broad range of research designs. Notably, three of these articles utilized a quasi-experimental approach to evaluate the impact of

the interventions (Crowley et al., 2025; Heagele et al., 2024; Matthew et al., 2019), six randomized control trials (Belleville et al., 2023a, 2025; Cowlshaw et al., 2023a; Mikocka-Walus et al., 2020; Obuobi-Donkor et al., 2024; Xiaolian & Song, 2023), two mixed-method studies (Wiciak et al., 2025; Yigzaw et al., 2023), and two qualitative research (*Ground Theory research: Disaster Reintegration Model* (DRM) for mental health recovery)(Choi et al., 2018; Contreras et al., 2022), one article case study (Keegan et al., 2018), and one article with cross sectional study (Shukla et al., 2024).

Evidence from the data extraction reveals that research on post-disaster resilience is geographically extensive, underscoring a global susceptibility to multifaceted threats. The identified nursing interventions span a broad spectrum of crises, ranging from natural disasters to armed conflicts and global pandemics. Such mapping is pivotal; the specific nature of a disaster dictates the resulting vulnerabilities and, consequently, the precise modalities of support required by the affected population

Table 2. Data Extraction and Result of the JBI Critical Appraisal Articles

Title	Author and year	Location and type of disaster	Study design	Population	Main result	JBI score
Addressing non-communicable disease management during disasters in the US Virgin Islands: a mixed methods study	(Wiciak et al., 2025)	US Virgin Islands / Extreme Hurricanes (Irma & Maria)	Mixed Methods Study (Survey and Interviews)	113 survey respondents and 15 NCD patient interview participants	The management of Non-Communicable Diseases (NCDs) is severely disrupted during crises due to the loss of access to medication supplies, which contributes to worsening depression and fear among survivors.	90%
Case study of resilient baton rouge: Applying depression collaborative care and community planning to disaster recovery	(Keegan et al., 2018)	United State (Baton Rouge) / 2016 mayor flood	Case Study / Preliminary Descriptive Evaluation	Partner institutions, licensed/non-licensed service providers, and the adult community.	Efforts to build local capacity through collaborative care for depression have proven effective in empowering community mental health service partnerships post-disaster.	78%
Comprehensive mental health and psychosocial support for war survivors at Chenna Kebele, Dabat woreda, North Gondar, Ethiopia	(Yigzaw et al., 2023)	Ethiopia (Chenna Kebele) / War and Armed Conflict	Explanatory Sequential Mixed Methods	550 war survivor households.	The high incidence of PTSD, particularly among women, calls for holistic interventions involving biopsychosocial support, pharmacotherapy, and the reconstruction of social networks.	78%
Disaster reintegration model: A qualitative analysis on developing korean disaster mental health support model	(Choi et al., 2018)	South Korea / General Disasters	Qualitative (Grounded Theory)	16 adults and older adults	Proposing a Disaster Reintegration Model (DRM) for the mental health recovery of survivors by promoting personal and public resilience, alongside cultural and spiritual elements.	100%
Efficacy of a Therapist-Assisted Self-Help Internet-Based Intervention Targeting PTSD, Depression, and Insomnia Symptoms After a Disaster: A Randomized Controlled Trial	(Belleville et al., 2023b)	Canada (Fort McMurray) / Wildfire	Randomized Controlled Trial (RCT)	136 disaster survivors	The guided self-help internet platform (RESILIENT) has successfully minimized the intensity of PTSD symptoms, insomnia, and post-traumatic depression among wildfire survivors.	85%

Table 2. Data Extraction and Result of the JBI Critical Appraisal Articles (continue)

Title	Author and year	Location and type of disaster	Study design	Population	Main result	JBI score
Expressive writing to combat distress associated with the COVID-19 pandemic in people with inflammatory bowel disease (WriteForIBD): A trial protocol	(Mikocka-Walus et al., 2020)	Australia/ COVID-19 pandemi	Randomized Controlled Trial (RCT) study protocol	A target of 154 adult patients with Inflammatory Bowel Disease (IBD)	Proposing a low-cost, 4-day online expressive writing program to address psychological distress and trauma in vulnerable patients during the pandemic.	89%
Improving mental health following multiple disasters in Australia: a randomized controlled trial of the Skills for Life Adjustment and Resilience (SOLAR) programme.	(Cowlishaw et al., 2023b)	Australia / Compound Disasters (Wildfires, Drought, Pandemic)	Randomized Controlled Trial (RCT)	66 partisipants	The SOLAR trauma skills intervention (locally guided) dramatically reduced PTSD symptoms, although over time its effects were comparable to standard self-help recovery methods	85%
Mitigating Psychological Problems Associated with the 2023 Wildfires in Alberta and Nova Scotia: Six-Week Outcomes from the Text4Hope Program	(Obuobi-Donkor et al., 2024)	Canada (Alberta & Nova Scotia) / WILDFIRE 2023	Longitudinal Naturalistic Controlled Trial	Disaster-affected individuals subscribed to the Text4Hope program	The Text4Hope CBT-based text messaging intervention program was significantly effective in reducing symptoms of depression (PHQ-9), anxiety (GAD-7), and PTSD, as well as decreasing suicidal ideation.	62%
The therapeutic value of trauma stabilisation in the treatment of post-traumatic stress disorder: A Southeast Asian Study	(Matthew et al., 2019)	Cambodia, Indonesia, Thailand / Natural Disasters and Violence	Pre-Post Intervention Study (Harvard Trauma Questionnaire Analysis)	Traumatized clients with clinical and subclinical PTSD	Self-managed trauma stabilization without trauma confrontation has proven to be highly effective, safe, and culturally flexible in reducing PTSD symptoms in crisis-affected regions.	78%
Tailoring Household Disaster Preparedness Interventions to Reduce Health Disparities: Nursing Implications from Machine Learning Importance Features from the 2018-2020 FEMA National Household Survey	(Shukla et al., 2024)	USA / General disasters (tornado, flood, hurricane, wildfire, earthquake, urban event)	Analytical Cross-Sectional Study (Machine Learning Analysis)	15,048 survey participants, focusing on older adults (65+) and African American/Black populations	Priority features for disaster preparedness differ by age and racial identity. Highlights the need for culturally tailored nursing interventions that address financial, transportation, and access disparities.	100 %
Disaster Recovery and Community-Dwelling Older Adults: An Intervention Study of Self-Efficacy	(Crowley et al., 2025)	Missouri, USA / General disasters (floods, tornadoes, winter storms, severe thunderstorms, extreme heat)	Intervention study (Pre-and post-intervention survey using Wilcoxon signed-rank test)	73 community-dwelling older adults (aged 60 and older)	Disaster recovery seminars significantly increased the overall self-efficacy of community-dwelling older adults for disaster recovery. Providing targeted, pre-disaster recovery education enhances confidence and resilience.	67%

Table 2. Data Extraction and Result of the JBI Critical Appraisal Articles (*continue*)

Title	Author and year	Location and type of disaster	Study design	Population	Main result	JBI score
Nurses Taking on Readiness Measures (N-TORM): A nurse-facilitated household emergency preparedness intervention feasibility study	(Heagele et al., 2024)	USA (New York) / General disasters	Quasi-Experimental (single group, before-after feasibility study)	31 elderly or medically frail community members with access and functional needs	Nurse-facilitated educational interventions (N-TORM) significantly enhanced the disaster resilience of vulnerable populations by drastically improving their emergency readiness scores (from 5.5 to 20.2). This proactive preparedness in securing medical supplies and evacuation plans serves as a critical foundation for them to adapt and bounce back during post-disaster crises.	77%
Application of health self-management intervention program for metabolic syndrome patients in the bereaved population following the Wenchuan earthquake	(Xiaolian & Song, 2023)	China / Wenchuan earthquake	Randomized Controlled Trial (RCT)	132 bereaved earthquake survivors with Metabolic Syndrome (chronic disease)	A nurse-led health self-management intervention program (integrating diet, exercise, medication, and emotional regulation) effectively improved the self-management behaviors and physiological resilience of bereaved metabolic syndrome patients in the post-earthquake recovery phase compared to the control group.	76%

Following the article selection process, the authors conducted a critical appraisal using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists. The results indicated robust methodological quality, with the majority of the Joanna Briggs Institute (JBI) Critical Appraisal Checklists scores exceeding 62%. All 15 articles were included in this scoping review; although some articles scored below 70%, the Joanna Briggs Institute (JBI) Critical Appraisal Checklists designates critical appraisal as an optional component for scoping reviews. Despite variations in methodological quality, these studies were retained to ensure a broad and comprehensive mapping of the literature, aligned with the primary objectives of a scoping review.

It is important to note that several included articles are study protocols. These were integrated into the synthesis to provide a forward-looking perspective on emerging nursing interventions, ensuring that our review captures not only completed empirical evidence but also the contemporary evolution of disaster-response strategies within the nursing discipline

4. DISCUSSION

Typology of Nursing Interventions and Support

The data extraction results indicate that the articles outline various interventions aimed at enhancing resilience among vulnerable groups in post-disaster contexts. The authors subsequently categorized and presented the data regarding these interventions in a tabular format to facilitate better understanding and clarity.

Table 3. Mapping of Interventions

Intervention Domain	Intervention Type	Intervention Objectives	Articles
Physical Domain	Chronic Disease & Health Self-Management Providing education and routine monitoring for NCDs. 1. Integrating diet, exercise, and medication management.	1. Reducing barriers to disease management and disrupted medication supply. 2. Improving physiological resilience and self-management behaviors.	(Wiciak et al., 2025) (Xiaolian & Song, 2023)
	Household Emergency Preparedness & Disparity Targeting 1. Nurse-facilitated face-to-face preparedness education (e.g., N-TORM). 2. Culturally tailored interventions based on disparities.	1. Securing medical supplies and establishing evacuation plans. 2. Addressing financial, transportation, and access disparities.	(Heagele et al., 2024) (Shukla et al., 2024)
	Community Healthcare Outreach & Informal Networks 1. Utilizing informal networks and community knowledge sharing.	1. Navigating challenging terrains to locate isolated vulnerable populations. Providing appropriate medical care to build resilience from the bottom up.	(Contreras et al., 2022)
Psychological Domain	Community-Based Psychosocial & Trauma Skills Programs 1. Task-shifting models (e.g., SOLAR, CBDMHI). 2. Collaborative care and biopsychosocial support. 3. Self-managed trauma stabilization and Disaster Reintegration Model (DRM).	1. Reducing symptoms of PTSD and mental health disorders. 2. Building local capacity and community mental health partnerships. 3. Promoting personal and public resilience safely without direct trauma confrontation.	(Choi et al., 2018) (Cowlshaw et al., 2023b) (Keegan et al., 2018) (Matthew et al., 2019) (Yigzaw et al., 2023)
	Digital-Based Interventions and Telenursing 1. Guided self-help internet platforms (e.g., RESILIENT). 2. CBT-based text messaging support (e.g., Text4Hope). 3. Online expressive writing programs (e.g., WriteForIBD).	1. Reducing the burden and intensity of psychological symptoms (PTSD, depression, anxiety, insomnia, suicidal ideation). 2. Addressing distress affordably and extending care to isolated groups.	(Belleville et al., 2025) (Belleville et al., 2023b) (Mikocka-Walus et al., 2020)
	Self-Efficacy & Pre-Disaster Recovery Education 1. Disaster recovery seminars targeted at community-dwelling populations.	1. Increasing overall self-efficacy for disaster recovery. 2. Enhancing confidence and cognitive resilience in facing crises.	(Obuobi-Donkor et al., 2024) (Crowley et al., 2025)

Psychosocial Skills-Based Programs at the Community Level: SOLAR and CBDMHI

The Skills for Life Adjustment and Resilience (SOLAR) program has emerged as a predominant and effective intervention, extensively implemented across various countries. SOLAR is designed as a brief, five-session intervention aimed at addressing sub-clinical post-disaster distress to prevent its progression into more severe mental health disorders (Cowlshaw et al., 2023a; Gibson, Little, Cowlshaw, Ipitoa Toromon, et al., 2021). The role of nurses in implementing this intervention is to serve as coaches or supervisors for non-professional personnel through a task-shifting model (Cowlshaw et al., 2023a). The SOLAR program encompasses emotional management (arousal management), healthy lifestyle promotion, emotional processing of trauma, and the strengthening of social support (Cowlshaw et al., 2023a; Donnell & Donnell,

2020; Gibson, Little, Cowlshaw, Ipitoa Toromon, et al., 2021). The significance of these findings is that they support the view that resilience can be strengthened through scalable, low-intensity, culturally adapted interventions rather than relying only on specialist-led trauma therapy after symptoms become severe. (Gibson, Little, Cowlshaw, Toromon, et al., 2021).

Meanwhile, the Community-Based Disaster Mental Health Intervention (CBDMHI) is an approach that emphasizes the integration of mental health support into local, community-based disaster preparedness structures. It ensures that interventions are culturally acceptable and sustainable through government coordination and the involvement of empowered community organizations or groups. This approach offers several advantages including it aligns more effectively with the community's specific needs and broadens the program's scope to the community level rather than focusing solely on individuals (Pike et al., 2024). One of the crucial aspects of CBDM is task-shifting, which refers to the distribution of mental health tasks from specialists (such as nurses and psychiatrists) to trained non-specialist health workers or community cadres (Pike et al., 2024). This approach is implemented to address the shortage of specialists in disaster-affected areas. In practice, trained community cadres can deliver interventions such as Problem-Solving Therapy or mental health education under the supervision of clinicians (Pike et al., 2024).

The foundation for the implementation of CBDMHI by nursing personnel is grounded in the international competency framework formulated by the International Council of Nurses (ICN) and the World Health Organization (WHO) (Loke & Fung, 2014). Nurses as the largest group of healthcare professionals with the most intense involvement on the front lines, play a vital role as care providers, service coordinators, educators, and counselors in disaster situations. (Pike et al., 2024). Disaster nursing competencies are not static; rather, they encompass a continuum of care involving the phases of mitigation, preparedness, response, and recovery (Pike et al., 2024). From a CBDM perspective, nurses must be able to operate beyond traditional clinical boundaries, embracing roles as community mobilizers capable of identifying risks at the population level and mobilizing existing sociocultural resources (Pike et al., 2024).

However, this theme also reveals several evidence gaps. Much of the evidence remains derived from pilot studies, protocols, small randomized trials, or context-specific programs, which limits conclusions about long-term effectiveness, cost-effectiveness, and implementation fidelity across different disaster settings. The outcomes are also dominated by PTSD, anxiety, and depression measures, whereas broader resilience outcomes such as social functioning, community participation, role recovery, quality of life, and sustained access to care are less consistently evaluated. In addition, vulnerable groups with layered risks, including people with disabilities, multimorbidity, cognitive impairment, or severe socioeconomic deprivation, remain underrepresented. Future studies should therefore test nurse-supervised community psychosocial models using longitudinal and implementation-focused designs that measure both individual recovery and community-level adaptive capacity.

Digital-Based Psychosocial Interventions and Telenursing

Digital-based psychosocial interventions and telenursing emerged as an important strategy for reaching vulnerable populations when physical access to health services is disrupted. One of

the innovative findings in the literature is the use of text messaging technology and internet platforms to reach vulnerable populations (Obuobi-Donkor et al., 2024). The Text4Hope program in Canada provides daily Cognitive Behavioural Therapy (CBT)-based text messages to thousands of participants over a three-month period (Obuobi-Donkor et al., 2024). Research findings consistently demonstrate a reduction in the prevalence of anxiety, depression, and suicidal ideation among users, particularly among women and cancer patients who were victims of wildfire disasters (Obuobi-Donkor et al., 2024).

The utilization of internet platforms, such as the Text4Hope program in Australia and the Internet-Based Trauma Recovery Nursing Intervention (IBTRNI) in South Korea, enables survivors to access recovery modules independently and flexibly (Kim et al., 2021; Obuobi-Donkor et al., 2024). Although the IBTRNI program was thoroughly developed based on nursing theory, adjustments are necessary because previous research did not specifically target vulnerable populations (Kim et al., 2021). Digital interventions have proven highly valuable for populations facing geographical barriers, social stigma, or time constraints, including nurses themselves who experience post-disaster trauma (Obuobi-Donkor et al., 2024).

Theoretically, these interventions add to resilience scholarship by demonstrating how technology can maintain protective connections and information flow during periods of disruption. In recent adaptations of Norris's community resilience framework, information and communication remain central adaptive capacities, and digital tools can preserve these capacities when conventional service pathways are damaged (Liu & Mostafavi, 2025). Digital self-help platforms also support self-efficacy reaffirmed as a core recovery principle in contemporary mass trauma interventions by allowing survivors to access coping strategies repeatedly and at their own pace (Hobfoll et al., 2018). At the same time, updated social-ecological theories caution that resilience depends on whether resources are actually accessible and culturally meaningful to the person; therefore, digital interventions should not be interpreted as universally empowering unless internet access, digital literacy, language, disability access, and privacy protections are addressed (Ungar & Theron, 2020). This finding therefore both supports existing resilience frameworks and challenges technology-optimistic assumptions by showing that digital resilience is inseparable from infrastructure and equity.

In real practice, significant challenges and barriers may hinder the implementation of telenursing interventions, given that the scale and impact of disaster damage vary across regions. These obstacles include technical barriers such as post-disaster communication infrastructure damage, power shortages for telehealth devices, and hardware/software incompatibility; human resource barriers like inadequate training, digital literacy disparities, and high workloads that impede technology adoption; ethical and legal barriers concerning data privacy risks and the lack of clear regulatory frameworks for disaster telenursing; and organizational and systemic barriers, characterized by ineffective multisectoral coordination, a lack of specific SOPs for disaster telenursing, and limited field-based research and evaluation (Aspas Sebastià & Navarro Martínez, 2024).

The evidence gaps in this theme are substantial. Current studies provide encouraging short-term outcomes, but there is limited evidence on sustained engagement, long-term symptom reduction, relapse prevention, or integration with routine nursing workflows after the acute

recovery phase. Few studies directly compare digital interventions with face-to-face, hybrid, or community-led models, making it difficult to determine which populations benefit most from each modality. There is also limited evidence from low-resource disaster settings where electricity, telecommunications, and device ownership may be unstable. Future research should evaluate nurse-led digital triage, stepped-care telenursing, data privacy safeguards, and accessibility adaptations for older adults, people with disabilities, patients with chronic illness, and communities with low digital literacy.

Chronic Disease Management and Biopsychosocial Support for Vulnerable Populations in Post-Disaster Settings

Chronic disease management and biopsychosocial support represent a distinct but equally important resilience pathway for vulnerable populations in post-disaster settings. The evidence indicates that disasters disrupt medication supply, routine monitoring, referral pathways, and access to medical devices, thereby worsening fear, depression, and perceived health insecurity among patients with non-communicable diseases (Wiciak et al., 2025). The significance of this finding is that resilience among chronically ill survivors cannot be reduced to psychological recovery alone; it also depends on continuity of care, resource security, symptom control, and the survivor's confidence that essential treatment will remain available during crisis conditions.

The results of the analysis indicate that some articles feature interventions targeting populations with specific physical vulnerabilities (Tanabe et al., 2022; Wiciak et al., 2025). In a study conducted by Wiciak et al., (2025) in the post-hurricane context of the Virgin Islands, nurses played a crucial role in managing non-communicable diseases (NCDs) amidst disrupted medication supply chains. Interventions included routine health monitoring, self-management education, and the provision of emotional support to alleviate the fear of disease recurrence during the crisis (Wiciak et al., 2025).

Global challenges in disaster settings directly impacting healthcare for chronic disease patients include healthcare workforce shortages due to the massive scale of the disaster and a lack of volunteers trained in post-disaster care. The evidence suggests that disruptions in the supply chains of essential medications and medical devices pose significant barriers for patients requiring specific treatments. These obstacles inevitably hinder healthcare delivery and indirectly diminish patients' quality of life due to restricted access to necessary medical resources. Additionally, psychological distress, such as anxiety and worry during a crisis, can exacerbate the health status of this vulnerable population, necessitating strategic solutions to address and prevent these adverse outcomes.

Solutions to these issues includes: first, providing patient education regarding the adaptation processes required during a crisis, which involves fostering an understanding of post-disaster conditions, creating an emotionally supportive environment to reduce anxiety, and promoting lifestyle modifications to prevent disease progression. Second, empowering disaster volunteers and encouraging the active participation of government and policymakers to enhance the distribution efficiency of medications, medical devices, and access to advanced health facilities. For patients with severe chronic conditions who are highly dependent on specific treatments, the

primary solution is to bridge the gap between medical supplies and those in need. Finally, establishing specialized shelters based on specific health conditions to facilitate systematic monitoring and enable healthcare providers to prioritize interventions for the most affected victims (Alanazi & Shaban, 2025; Iyer et al., 2025; Leppold et al., 2023).

Nevertheless, the evidence base for this theme remains comparatively thin. Only a limited number of included studies directly addressed chronic disease management, and much of the available evidence describes barriers rather than testing specific nurse-led interventions. There is insufficient evidence on which continuity-of-care models are most effective for different chronic conditions, how to prioritize patients with multimorbidity, and how specialized shelters, medication distribution systems, telemonitoring, or community volunteer networks affect clinical outcomes. Future research should include implementation trials that measure both psychosocial and biomedical outcomes, such as disease control, hospitalization, medication adherence, functional status, mortality risk, and quality of life. Stronger evidence is also needed on how nurses can coordinate chronic disease care across disaster phases while protecting equity for patients with limited income, disability, or poor access to transportation.

Across the three themes, the central implication is that resilience-building nursing interventions work best when they operate at multiple levels simultaneously: strengthening individual coping skills, preserving social connectedness, maintaining access to health information, and protecting essential health resources. This multilevel interpretation is consistent with resilience theories that view recovery as a dynamic interaction between individuals and their social, cultural, technological, and health-system environments rather than as a fixed personal trait (Masten, 2001; Norris et al., 2008; Ungar, 2011). For future nursing practice and research, this means that resilience interventions should be designed not only to reduce symptoms, but also to rebuild adaptive systems around vulnerable survivors, including families, community networks, digital communication channels, and chronic care infrastructure.

5. LIMITATIONS

Current literature on nursing interventions to enhance post-disaster resilience exhibits several key limitations. The high degree of heterogeneity in study designs, vulnerable population characteristics, disaster types, and intervention modalities leads to inconsistent findings and complicates comparative evidence synthesis. Furthermore, most research focuses predominantly on mental health outcomes such as PTSD, anxiety, and depression while broader dimensions of resilience, including quality of life, social functioning, and long-term adaptation, remain insufficiently evaluated. There is also a lack of research specifically targeting highly complex vulnerable groups, such as individuals with disabilities or multimorbidity, resulting in a superficial understanding of their unique needs. Additionally, most studies assess short-term intervention effectiveness, with a notable paucity of evidence regarding long-term sustainability and the integration of these interventions into post-disaster healthcare systems. Finally, the variation in non-standardized resilience outcome measures further limits cross-study comparisons and the development of robust, evidence-based recommendations

6. IMPLICATIONS

This literature underscores the need for stronger, standardized, and contextualized evidence. Future research should prioritize implementation studies that evaluate the feasibility and sustainability of interventions, while expanding the involvement of underrepresented vulnerable groups. Furthermore, comparative evaluations between interventions, long-term outcome measurements, and the harmonization of resilience indicators are required. The adoption of longitudinal, mixed-methods, and hybrid effectiveness-implementation designs is essential to understanding not only effectiveness but also the mechanisms and contexts of intervention success. These findings emphasize the vital integration of nursing, public health, and disaster management policies. Policy frameworks must strengthen nursing capacity, ensure continuity of care including mental health support and chronic disease management and develop systems responsive to the needs of vulnerable populations. Additionally, regulations concerning health technology utilization, data protection, and the financing of recovery services need to be fortified. Overall, nurses must be recognized for their pivotal role throughout the post-disaster recovery phase, extending far beyond the emergency response stage

7. CONCLUSION

This review has successfully delineated the landscape of evidence regarding nursing-led and nursing-supported interventions, systematically categorizing strategies into distinct physical and psychological domains. The findings demonstrate that the nursing profession occupies a pivotal position in disaster management, transcending traditional clinical paradigms to function as systemic coordinators who mobilize community resources to enhance both physical and psychological resilience among vulnerable populations.

In the physical domain, interventions focused on chronic disease management, health self-management, and household emergency preparedness have proven essential in maintaining physiological stability and functional readiness amidst disaster-induced disruptions. Concurrently, in the psychological domain, community-based psychosocial programs and digital-based telenursing have demonstrated efficacy in mitigating trauma-related symptoms and providing accessible support for geographically isolated survivors.

Despite these advancements, the synthesis identifies significant evidence gaps regarding the long-term sustainability of these models, the standardization of resilience metrics, and the management of "layered vulnerabilities" where physical and mental health risks intersect. Consequently, these findings advocate for a paradigm shift in disaster nursing—transitioning toward integrated, evidence-informed, and community-centered frameworks. Such a shift is imperative to ensure continuity of care and to fortify the holistic recovery of vulnerable survivors across the complex post-disaster continuum.

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9. CONFLICT OF INTEREST

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