Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Building Disaster Resilience in Early Childhood with Special Needs: A Systematic Review of Psychological Preparedness in Inclusive Early Childhood Education and Special Schools in Indonesia

MA Muazar Habibi

muazar.habibi@unram.ac.id

Mataram University: Universitas Mataram https://orcid.org/0000-0001-8771-5583

Jundu Muhammad Mufakkirul Islami

jundumuhammad@staff.unram.ac.id

University of Mataram https://orcid.org/0009-0009-1896-125X

Systematic Review

Keywords: disaster psychology, inclusive education, children with disabilities, psychological preparedness, Indonesia, SEND, resilience, local wisdom, systematic review

Posted Date: October 11th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11302421/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: The authors declare no competing interests.

Abstract

Background: A disproportionate number of Indonesian children with special education needs and disabilities (SEND) face psychological risks during disasters as the country is geophysically open and there are gaps in inclusive disaster education. Objective: Our work presents the synthesis of empirical findings on psychological preparedness and resilience for young children with SEND in inclusive early childhood education and special schools in Indonesia.

Methods: We conducted a search of five databases and an advanced search of Google Scholar (2016, 2026) under PRISMA and pre-registered PICOS criteria to screen out non-peer-reviewed articles and those irrelevant. These were followed by quality appraisal using MMAT with qualitative synthesis.

Results: Twenty-eight studies were found. Five themes: institutional readiness, teacher competence, inclusive curriculum, family/community support, and local wisdom were identified as common factors across the included studies. Interventions led to preparedness gains of up to 39%. The majority of evidence is coming from Java and Sumatra.

Conclusion: Psychological preparedness is part of a system design that needs to be brought to life through trauma-informed methods, which are based on and respectful of the local culture. This is how we imagine, in our framework Psychological Disaster Readiness for Children with SEND.

1. Introduction

1.1 Global Context and Disaster Psychology

The increasing occurrences, impacts, and intricacy of climate-related and geophysical disasters are leading disaster psychology to one of the most rapidly changing disciplines in the domain of applied psychology (Kip et al., 2025). Disruptions caused by disasters go well beyond just the destruction of buildings and homes, they change lives and families, hinder progress in education, and fragment the social network, bringing about psychological consequences that may linger long after the natural threat itself has ceased. So modern-day disaster studies have gradually come up with the idea that the effectiveness of disaster management cannot be measured only by deaths or economic damages. One also needs to take psychologically how people adjust and cope up as well as long-term developmental impacts especially among the most vulnerable.

Disasters usually affect the mentally most vulnerable ones, the children. Children's physical, intellectual, emotional, and social growth is a long process before reaching adulthood. On the contrary, young children have little chance of recognizing environmental dangers, controlling their feelings, deciding which steps to protect themselves from disasters.

As a result, disaster-related experiences in children's formative period probably influence emotional control, self-regulatory mechanisms, secure attachment, and school involvement throughout the rest of

the person's development process.

Psychological readyness or preparedness is, therefore, a way of prevention going beyond what a knowledge-based intervention can achieve that includes helping children become capable of recognizing, interpreting, and coping with dangerous situations with fearlessness rather than fear.

The developmental psychology offers an important framework for interpreting the changes involved in coping with adversity. Masten and Obradović (2008) stated that the way one responds to a disaster at the time can be thought of as a kind of a life experience that is being shaped and changed in different development stages by the various systems (e.g., the family, the schools, the neighbors, the laws).

The first few early years of life are particularly important for the overall growth of various abilities in kids related to emotions, communication, thinking, and the ability to connect with others as these capabilities are closely connected and rapidly developing through neurological maturation taking place during this period. Therefore, it seems the most promising way to enhance children's abilities to face adversities in their lives and to promote a resilient personality would be to carry out preventive initiatives in young children before any such adversities arise and during that period help the kids to strengthen their self-control, decision-making powers, and different coping strategies.

In other words, Masten (2020) describes resilience not only as the individual's strength to overcome difficult situations but also an ability emerging from multiple interacting systems involving the individual's genetic, physical, and psychosocial environment including parents, peers, community, and even the government.

In case of disaster resilience, therefore, it should be viewed as a result, the whole is greater than sum, which one gets when different elements such as personal and environmental factors are harmoniously and mutually supporting each other rather than a property that children have individually.

Among all those systems of life for children and youth that support them in their adaptation to disaster, schools play a very special role and a very unique position. On one hand, they educate and teach. Then also, they function as one of the main places where children get the psychological support they need. They also become part of the overall city's infrastructure that helps the community in emergencies. Boon et al. (2011) say that it's a good example of when children are at one time involved in different environments in their daily life as in their home, school, and neighborhood but those are at the same time influencing the bigger picture, laws, and policies for example.

In cases of disasters, the school goes beyond becoming merely a learning place and becomes an evacuation site, an agency of providing accurate information and psychosocial services to a community, and a center of recovery. It follows that building psychological preparedness in schools goes beyond a schoolchildren level to also benefit the community in general with their disaster management capability.

Yet for children with Special Educational Needs and Disabilities (SEND) the schools are even more important because they support the development of those children. Usually those who are more SEND

oriented need to have structured routines, predictable communication, familiar environments, and specialist educational support in order to sustain their mental functioning. The disasters break down all those protective circumstances which are known to the child and could cause anxiety, behavioral dysregulation, overloading the sensory system, and a child being very emotional. That is the reason why psychology in a disaster setting is more and more encouraging to use approaches of preparation that include developmental science, trauma-aware teaching, and inclusive pedagogical practices instead of just relying on traditional methods of crisis management and emergency.

1.2 Geographic Disaster Risk of Indonesia

Indonesia has to cope with one of the most complicated disaster contexts in the world due to its distinctive geology, weather conditions, and geographical settings. As a place between the Indo-Australian, Eurasian, and Pacific tectonic plates of the Pacific Ring of Fire, the country faces regularly earthquakes, tsunamis, volcanic eruptions, landslides, floods, droughts, and other problems in very high numbers (Muzani et al., 2022; Nopriyasman et al., 2024). Climate extremes interacting with tectonic motion is making disasters still riskier. So, hazards of different kinds affecting simultaneously large towns and small rural villages.

This experience of being surrounded by disasters has very deep effects on education system. They are becoming a part of our lives and a major source of interruption for children's learning and even their emotional states. The loss of time when learning is stopped, destruction of physical resources like buildings, the family being out of the home, disruption of the usual learning activities, and getting continuously exposed to the uncertain disaster are all together leading to persistent developmental problems. It means that besides being a school Indonesian schools also need to be a main player in disaster risk reduction efforts on the national level.

Reports have proven how big this task is for Indonesia. According to Rofiah, Kawai, and Hayati (2021) approximately some 62, 687 schools in Indonesia are under the risk of disaster exposure. More than 90% of them are schools located within the regions vulnerable to disasters. Around 91, 000 disabled children were attending inclusive primary schools in the country at that time. These figures show very clearly that on one hand, the school houses that protect the children from being exposed to disaster on another hand, are themselves in places exposed to disasters.

The picture gets even more intricate when considering the differences in terms of geographical distribution of resources for education. Remote islands, mountainous regions, and rural places are all places where schools face challenges such as scarce disaster-resilient facilities, specialized personnel, psychologist support, and communication systems that are ready in emergencies. This kind of gap could seriously hamper school's capacity to deliver disasterpreparedness programmes for children who are more vulnerable through need individual education support.

The huge diversity of the geographical feature of Indonesia plays a big role in how people and communities are affected by disasters. The people living near the shores are threatened by a tsunami.

The communities near the volcano are hit repeatedly by the eruption of the volcano or the falling of ash. Meanwhile the people suffering from floods can be found in the urban areas that are prone to flood during the rainy season caused by the climate change. Hence, such diversity calls for disaster education which is not limited to one national model but rather one that changes according to place, reflects hazard profiles of the area, cultural practices, and systems of knowledge of the community.

More and more, researchers claim, indigenous knowledge should be considered not just a piece of cultural heritage but a valuable part of disaster resilience. Local environmental knowledge, historical stories, environmental change indicators and, community-based evacuation methods, all may serve as a supplement to formal disaster education by delivering culturally meaningful insights (Nopriyasman et al., 2024). It should be considered that the blending of these diverse knowledge systems in school-based disaster education might lead to psychological preparedness being reinforced alongside cultural identity and community engagement, especially in young children, for whom learning is largely tied to familiar cultural practices.

1.3 The Psychology of Children with Special Educational Needs and Disaster Vulnerability

Disasters expose special children with disabilities (i.e. SEND) sensory, physical, intellectual, developmental, behavioural, and multiple to disproportionately higher levels of psychological risks compared to their typically developing peers at times of disaster. This extra vulnerability is not a function of disability alone. Rather, it is disability intersected and layered with more general disability, environmental, and institutional inequities.

Contemporary scholarship on this issue has begun to question the use of medically oriented explanations of disability-related vulnerability alone and focuses heavily on the ways in which one's attributes and their interaction with surrounding barriers, such as, prevent people from getting involved in disaster preparedness and response, may restrict participation.

Peek and Stough (2010) have explained five main factors related to children with disabilities becoming more vulnerable to: increased incidence of poverty, disproportionate presence of hazards, likelihood of separation from caregivers during an emergency, and parents' increased level of stress as well as reduced availability of post-disaster recovery resources. Significantly, such factors hardly take place independently. Instead, they complement and support one another on several interdependent ecological levels, which together create disadvantages that will linger throughout the disaster recovery process.'

More recent findings add to these conclusions. The authors of Mann, McMillan, Silver et al. (2021), who were working together as a team, pointed out that in disasters as well during and after the pandemic with corona, kids with disabilities keep facing systemic problems that hit their health, education, emergency communication, and psychosocial support. Disasters do not generally lead to new problems but, rather, they tend to reveal and widen the existing social gap by exposing the lack of preparedness in health, education and social protection sectors at structural levels.

Ronoh, Gaillard and Marlowe (2015) gave further meaning to the concept of disaster vulnerability related to disability through the lens of intersectionality, saying that in this case, the child's age, disability, gender, location, socio-economic level, and culture will have an interactive rather than cumulative relationship. It means that two children who have similar disabilities might end up in very different situations after a disaster based on such things as family support, educational opportunities, community openness and how ready the institution that will respond to their situation is.

Recognition of these differences has grown internationally. The Sendai Framework for Disaster Risk Reduction (2015, 2030) specifically encourages the meaningful participation of people with disabilities at all stages of disaster risk management. However, despite this effort, Bennett (2020) came to a conclusion that the realization of disability inclusion on the ground is still inconsistent globally and although disability inclusion is acknowledged quite often in policy language, it is not yet well incorporated in the actual plans at grassroots level, resource allocation as well as evaluation of performance. Boon et al. (2011) made a similar point when they showed how school emergency plans often lacked considerations of accessibility of buildings, ways of communication and the availability of psychosocial assistance to children with disabilities.

As a whole, these evidential findings suggest that the way of preparing the children with SEND for disaster has become more intricate and should not be reduced to just revising the emergency procedures. What is essential is a holistic psychological, child-appropriate and ecologically sensitive model which at the same time considers the factors of educational inclusion, institutional preparation, family engagement, community participation and policy implementation. This method has the potential for conceptualizing an idea for the current systematic review aimed at how psychological preparedness has been conceptualised, implemented, and evaluated in the context of Indonesian inclusive early childhood education/special schools.

2. Methods

2.1 Study Design and Protocol

A systematic review was conducted in accordance with PRISMA 2020 guidelines. The protocol was registered with the Open Science Framework.

2.2 Research Questions

- **RQ1**: What psychological preparedness constructs and outcomes have been used for Indonesian children with SEND?
- **RQ2**: How do institutional, teacher, family, community, and policy factors interact?
- **RQ3**: What intervention models have been evaluated and what effects do they produce?
- **RQ4**: What is the methodological quality and geographic distribution of evidence?
- **RQ5**: How can a synthesis-based framework inform research, policy, and practice?

2.3 PICOS Framework

Table 1
PICOS Framework

Element	Specification
Population (P)	Children aged 0–12 with sensory, physical, intellectual, social-emotional, or multiple disabilities; teachers of such children; parents; principals
Intervention (I)	School-based DRR/SPAB programs; inclusive disaster curricula; visual, sensory, or simulation-based adaptations; teacher psychological competency training; family/community preparedness; local wisdom integration
Comparator (C)	Standard curriculum; pre-intervention baselines; cross-school comparisons; inclusive vs. SLB
Outcomes (O)	Psychological preparedness (knowledge, risk perception, self-efficacy, coping); teacher competency; institutional readiness; inclusive practice; child trauma recovery; family preparedness
Study Design (S)	Quantitative, qualitative (interview, focus group, ethnography), mixed-methods, systematic reviews

2.4 Eligibility Criteria

Table 2
Eligibility Criteria

Criterion	Inclusion	Exclusion
Period	2016–2026	Pre-2016 (except seminal theoretical works)
Geography	Indonesia, school settings	Cross-country without disaggregated data
Language	English; Bahasa Indonesia	Others without authoritative translation
Population	Children with SEND; teachers; parents; school leaders	Adults only; no SEND subgroup
Disasters	Natural, climate-related, geological	Man-made, technological, war
Design	Empirical primary and secondary	Opinion pieces; blogs; posters without data

2.5 Information Sources and Search Strategy

Five databases, Google Scholar, and the Indonesian repository SINTA were searched. Boolean operators combined three concept blocks (SEND AND disaster preparedness AND Indonesia) with controlled vocabulary. Searches were executed between July 2025 and June 2026.

Table 3
Database Search Strategy

Database	Search String Sample	Filters	Hits
Scopus	TITLE-ABS-KEY (("disaster preparedness" OR DRR OR SPAB) AND ("special needs" OR disability OR "inclusive education" OR SEND) AND Indonesia)	2016–2026	612
Web of Science	TS = ((disaster preparedness OR DRR OR psychological preparedness) AND (children with disabilities OR inclusive education) AND Indonesia)	2016–2026	487
PubMed	((disaster preparedness[MeSH] OR psychological preparedness) AND (disabled children[MeSH] OR special education) AND Indonesia)	2016–2026	238
PsycINFO	AB = (disaster OR preparedness OR resilience) AND (disability OR special needs) AND Indonesia	2016–2026	311
ERIC	("disaster education" OR DRR) AND ("inclusive education" OR "children with disabilities") AND Indonesia	2016–2026	192
Google Scholar	"disaster preparedness" AND "children with disabilities" AND Indonesia	2016–2026	421
SINTA	"kesiapsiagaan bencana" AND ("anak berkebutuhan khusus" OR inklusi) AND Indonesia	2016–2026	187

After deduplication (n = 597 removed), 1,892 records were retained.

2.6 Study Selection & 2.7 Data Extraction

Two reviewers carried out titles and abstracts screening independently with the help of Rayyan. Disagreements were settled by reaching an agreement. Titles screening of entire texts was continued after the completion.

To facilitate the extraction authors, year, province, type of disability, number of participants, type of disaster, research design, psychological outcomes, major findings, intervention characteristics, barriers/enablers, and risk-of-bias indicators were all covered in one standardized format.

2.8 Quality Assessment

Table 4
Quality Assessment

Study	Design	MMAT Score (%)	Quality
Rofiah et al., 2021	Qualitative	80	High
Sheehy et al., 2022	Mixed (review + survey)	100	High
Rofiah & Kawai, 2025	Quasi-experimental	80	High
Dwiningtias et al., 2025	Qualitative	60	Moderate
Cabatay & Pujaningsih, 2025	Quantitative ex post facto	80	High
Indriasari et al., 2018	Quasi-experimental	60	Moderate

2.9 Data Synthesis & 2.10 Reviewer Agreement

A mixed methods (convergent) thematic analysis of data with a combination of qualities-quantitative data was carried out according to Thomas and Harden approach. The results were categorized into codes and arranged into descriptions followed by the integration of analytical themes. The themes of PDRF-SEND were well-aligned to these analytical themes. There was an inter-rater agreement of 0.84 on whether a certain item should be a research focus or not.

3. Results

3.1 PRISMA Flow & 3.2 Conceptual Framework

Figure 1. PRISMA 2020 Flow Diagram.

Identification (n = 2,489) → Deduplication (n = 597 removed) → Records screened (n = 1,892) → Excluded at title/abstract (n = 1,610) → Full-text assessed (n = 282) → Excluded with reasons (n = 254) → Studies included (n = 28).

Figure 2. PDRF-SEND Framework.

Cascading architecture: National Policy → School Leadership → Teacher Psychological Competency → Inclusive Curriculum → Family Support → Community Support → Local Wisdom → Psychological Preparedness → Disaster Resilience.

3.3 Characteristics of Included Studies

Table 5
Characteristics of Included Studies (Selected key findings)

Author	Province	Disaster	Design	Key Findings
Rofiah, Kawai, Hayati (2021)	Yogyakarta	Multi-hazard	Qualitative	Accessibility strongest factor in DiDRR; 91,000 children with special needs in inclusive primaries as of 2018
Sheehy et al. (2022)	National	Multi-hazard	Mixed	Children with SEND largely absent from DRRE programmes and evaluations
Indriasari et al. (2018)	Yogyakarta	Earthquake	Quasi-experimental	39% preparedness increase after five simulations
Lestari et al. (2025)	Medan & Yogya	Multi-hazard	Quasi-experimental	Post-test 78.4 (experimental) vs 52.3 (control); $p < 0.001$

3.4 Cross-Study Comparison

Table 6
Cross-Study Comparison

Domain	Inclusive Settings	SLB / Special Schools
Teacher Capacity	Kurniawati (2021): limited differentiation, low confidence	Dwiningtias et al. (2025): visual media effective; Indriasari et al. (2018): 39% preparedness gain
Institutional Readiness	Rofiah et al. (2024): accessibility strongest DRR factor	Cabatay & Pujaningsih (2025): compliance inversely linked to teacher challenges
Local Wisdom	Lestari et al. (2025): 78.4 vs 52.3 ($p < 0.001$)	Nopriyasman et al. (2024): indigenous knowledge includes evacuation cues

3.5 Thematic Synthesis & 3.6 Psychological Intervention Mapping

Table 7
Thematic Synthesis

Theme	Evidence Focus	Psychological Interpretation
Institutional Readiness	SPAB compliance; physical accessibility	Accessibility functions as a proximal psychological safety cue; agency is shaped by the built environment.
Teacher Competency	Psychological first aid; differentiation	Teacher mental health is a sentinel variable for child psychological response.
Psychological Intervention	Simulation-based learning; visual media	Repeated exposure reduces anxiety through predictability and mastery experiences.

4. Discussion

4.1 The Multisystem Imperative

The research findings gathered and reviewed in this paper further underline the point that being mentally ready for an emergency situation is much more multifaceted than children with Special Educational Needs and Disabilities (SEND) being psychologically prepared in isolation at the mental level only. Instead, preparedness is a product of the interaction over time of the mental, emotional, social, institutional, and environmental systems. This is in full agreement with Bronfenbrenner's ecological systems theory and Masten's multisystem resilience framework, according to which disaster preparedness is a child's developmental context, rather than residing solely within the infant. It turns the current review into a demonstration that mental awareness is only one part of preparedness. It is also a condition on the availability and support of responsive social relationships, accessible physical surroundings, and inclusive institutional policies.

Boon et al., 2009, the findings, as far as development and disability among children is concerned, it was found that psychological well-being could be determined by cognitive aspects, but these, along, were not effective without the combination of physical and social support.

This discovery is in step with the understanding of disaster psychology these days which views resilience as a developing outcome that stems from interaction among people and their surroundings instead of it being a static quality. Even if children are capable and knowledgeable about evacuation methods, warning signals, and hazards, they may feel overwhelmed and show inappropriate behaviour if their environment is not supportive of proper reactions. This is because a child's response to the situation depends not only on his/her knowledge but also on the environment's capacity to support the child's response, as illustrated earlier in this section.

The evidence reviewed points out that a child's psychological preparedness should also be deemed at least a partly physical issue that includes not only knowledge but also emotions, the ability to be confident in oneself, the capability of behaving in a proper way, the ability to use and interact properly with surroundings, and being socially connected.

The dimensions mentioned are intertwined with each other continuously from pre-disaster, during, to immediate and later on disaster stages. For instance, a child with autism spectrum disorder may well comprehend emergency plans but still not be able to act accordingly unless his surroundings, e.g., the emergency communication that is unclear, sensory overload, or disrupted routines, etc are taken care of.

The multifactorial nature of being able to cope with the crisis situation is best captured by the model of multilevel systems. In the case of an emergency at the school, for example

The results are also in line with Masten's view that resilient children are the outcomes of ordinary adaptive systems as opposed to heroic ones. Teacher support, peer relationships, regular school

routines, ease of communication, and family participation are all examples of protective factors which together create a strong foundation for children to adapt before they experience a disaster. Therefore, preparedness programmes can be more successful by focusing not only on teaching facts but also on improving the systems that support children's mental health over time.

A different but equally significant implication is the relationship between physical accessibility and psychological resilience. Accessible environments such as barrier-free evacuation routes, easy-to-identify directional signs, sensory-friendly spaces, and adaptive learning materials not only protect physically from danger but also increase children's feeling of competence and control. Psychological research consistently shows that the sense of control one has over a situation reduces anxiety in threatening scenarios. Therefore, accessibility should not be just considered a matter of engineering and architecture but as a psychological intervention which can build confidence, increase independence, and help regulate emotions of children receiving support for Special Educational Needs and Disabilities.

Above all, the study results show that the preparation of children with Special Educational Needs and Disabilities for disasters is a process that occurs within an ecosystem in which cognitive learning, emotional safety, the capability of the institution, the involvement of the family, and inclusive educational practices come together synergistically. This perspective of multiple systems interacting is the basis for the Psychological Disaster Readiness Framework for Children with Send (Pdrf -SEND) put forward by this review, as it shows that psychological preparedness is the product of a network of protective systems working hand in hand, not just a series of educational interventions.

4.2 The Role of Teachers and Accessible Learning

One feature of all the research examined here is the role of teachers in enabling children with special needs to prepare psychologically for disasters. Teachers are more than just teachers; they guide children through learning, emotionally support them, teach children to model certain behaviors, communicate about risks and create safe psycho-physic learning environments. The presence of teachers can even be perceived as that of caregivers who help children establish secure attachments, especially for small children or those who are disabled at birth, thereby making them feel safe, predictable, and confident during both normal schooling days and in emergency situations.

The research here also points out that teachers are the category of professionals who, more than any others, come in close contact with and support children during the time of psychological disaster preparation. Nonetheless, studies show that there are also several constraints in the ability of teachers to prepare children psychologically for disasters. Kurniawati (2021) pointed out that only a few educators regularly employed instruction methods specially tailored for disabled children, mainly in the case of rural, underserviced and impoverished communities. Most teachers were in favor of inclusive education, yet, they indicated that training for disabilities was lacking, they were not getting the right materials, and they were unaware as to how to adjust for their teaching during disaster education.

Teacher preparedness needs to be regarded not just as the capacity of teachers to work with a certain category of learners, but also as a pre-condition for children's readiness. A teacher can be well-versed in disasters and still fail to meet the developmental needs of a disabled child if he or she is not well-informed about disabilities. Conversely, a teacher who has been trained to work with disabled children may still fail to protect kids properly when it comes to emergencies if the teacher is unaware of how an emergency is handled. Therefore, if we want to create holistic professional development for teachers, we should integrate both areas of knowledge simultaneously, so that special education knowledge is taught side by side with disaster risk awareness, psychological emergency response, trauma-aware education, and communication with children during disasters.

In addition to identifying accessible learning environments as the major influencing factor, the present review emphasizes how such environments contribute greatly to children's psychological readiness. Accessibility is more than a set of rules; a child-friendly environment includes various aspects such as communication mode, teaching materials, class schedules, and emotional support that make the child's presence in readiness activities meaningful and active. Some examples of tools reducing the sense of uncertainty and raising children's confidence include visual schedules, social stories, language used in an easy-to-understand way, tactile learning materials, sign language, picture-based communication, sensory supports, and consistent class routines all of which help children.

From a psychological point, accessibility is about helping children to regain a feeling of control when there are potentially dangerous events around. If children learn what is expected of them, they learn how to respond appropriately to changes in the environment, and they get a chance to be involved in preparing themselves, children are transformed into active participants rather than the passive ones who only rely on others' help. The belief in one's ability is a major factor of protection against psychological discomfort following a disaster.

The studies indicate accessibility helps to counter disability-related learned helplessness of children. Being continually in the situation of someone helping to the point of total dependence might result in children considering themselves incapable of reacting on their own in emergencies. By means of inclusive education about disasters, such ideas are challenged at least partly. The disaster educational programs for children provide kids with a chance to achieve success through the experience. If a child manages to evacuate alone, knows how to identify a warning, or is able to use an effective coping strategy, it boosts the kid's self-efficacy. This way kids' disaster preparedness, as well as emotional strength get strengthened.

This discovery is very crucial since earlier works in disaster related to psychology have shown that helplessness is a strong sign for developing symptoms of post-traumatic stress in response to traumatic experience.

Hestyanti, (2006) looked into the children who were affected by Aceh tsunami, the child's psychological outcomes due to overwhelming disaster experience documented have been identified as long terms. In a similar instance, Lieber (2017) stated post-Great Japan Earthquake that children's feelings that nothing

bad was ever going to happen had led the kids to more psychological distress. Therefore, it is concluded that in preparedness programs one should not only teach emergency procedures but also work on building up children's confidence by their own means of adaptation.

Teacher's well-being as one of the children's preparedness components is also one of those that are hardly recognized but play a significant role. Teachers who are dealing with burnout or other forms of stress, or anxiety caused by the disaster scenario, might, without noticing, scare or disorient students because of the fear or uncertainty that is transmitted in that way. On the other hand, emotionally prepared educators who know how to stay cool through situations, resolve problems, and manage themselves in tough situations are examples for kids to follow which children do.

This interplay of teachers' mental health supports and children's preparedness through the teacher highlights the necessity of having teacher well-being as an essential element of disaster preparedness for children at schools.

Also, it is evident from the literature that teacher-student collaboration, psychologists, school leaders, therapists, and families should play a vital role in developing and maintaining an inclusive preparedness program. Disaster-related education cannot be carried out as the responsibility of classroom teachers alone but should be an institutional effort in coordination among different disciplines. Such kind of interaction will ensure that not all aspects but especially those related children's various ways of communication, their sensory sensitivities, different levels of mobility, and psychological states of the kids will be included in the emergency planning.

To sum up, the data clearly show that teacher knowledge and educational accessibility serve as two factors influencing psychological readiness quite closely. So, investing in teacher education programs and inclusive teaching as well as making the learning areas more accessible is most likely to have a great positive impact on children's sense of security, their preparedness for emergencies, and their resilience in the long term.

4.3 Education Styles, Role-plays, and Cultural Customs

The evidence from this review suggests that teaching style is a major factor in deciding how mentally ready children, especially those with special needs, are for disasters. The major difference that was found in almost all studies was that the interventions focused on children's active involvement, the learning of protective behaviours in a realistic scenario, the use of multiple senses and the learning of the subject in a contextual way were more effective than just providing information. These results are in line with current learning theories that children can acquire knowledge more efficiently if they actively and constructively do things, instead of just being supplied with knowledge.

Comparative experimental studies have shown a very clear trend that the regular use of disaster simulations involving multiple senses significantly raises preparedness level of the children with SEND significantly. With simulation-based learning, children are able to go through what they are supposed to do in case of a disaster in a safe environment from a psychological standpoint. The more times they are

exposed to these situations, the more they get used to the fact that the situation does not present a risk and therefore they can react appropriately by the time real disaster strikes. This process is quite like what psychologists who treat anxiety disorders and other mental issues have been using for many years a step-by-step increase in the level of the situation that causes discomfort to the patient (graduated exposure) until the patient becomes so tolerant of it that is not a problem anymore.

Not only do Disaster simulations help children with the rehearsing of protective behaviours but also help to build a children's sense of mastery. Through participating in the simulations over and again children have the opportunities to successfully complete the disaster tasks and in doing so develop self-efficacy. As they start getting more confident, the children come to see disaster situations as challenges that they can manage instead of situations that are overwhelming. Such a change of attitude is very useful especially for the ones who have developmental disabilities because these children are known to thrive in the environment if the repetition, the use of visuals, as well as the establishment of routines are included as part of it.

Multi-sensory instructional approaches are the most effective because they provide multiple modes for understanding. These could include visual demonstrations, tactile materials, role- playing games, social stories, physical movement to learn, and audio reminders. These are all different ways by which children can internalize the message about emergency procedures. This approach of offering a range of learning experiences supports the principles of Universal Design for Learning by providing equal chances of meaningful participation to children of different cognitive, sensory, or communication abilities.

Indigenous knowledge and local wisdom can also support psychological preparedness as the review indicates. Nopriyasman et al. (2024) wrote about how, even now, some traditional customs such as transition ceremonies, taboos, monitoring of the environment, and interpreting of nature these are still functioning within Indonesian communities as cultural disaster warning systems. These practices, developed as results of generations of communities dealing with and learning from natural disasters, are a reflection of community wisdom.

Tradition can also contribute psychologically to preparedness, by creating culturally-relevant interpretations of a child's view of nature. This is done by means of storytelling using known plots, local symbols, customary rituals, and passing stories across generations. All together, these elements reduce the level of uncertainty and ambiguity in case of a disaster, which could be threatening to a degree, at the same time they foster a sense of belonging and collective identification. A continuity of a culture itself is likely to be a protective factor at the time of disasters as it promotes emotional stability and unity of people within the community, which are very important during such an event.

A combination of scientific and indigenous disaster education thus could be a great addition to preparing children for disasters. Not only would it allow indigenous knowledge to inform children in a culturally resonant way, but the combination of different types of knowledge will make preparation of children for disasters more effective.

In the aggregate, we see an ideal scenario in which disaster education for handicapped children is delivered by means of simulations, a range of teaching and learning activities which are inclusive of all children, trauma-aware teaching methods, and exposure to learning of disasters at least partially within the cultural context. Such an approach will not only get more immediate results by way of making the children prepared in the short run, but will also, in the course of time, help build their mental strength, their resilience and confidence as well as their ability to cope adequately and to face disasters in the future.

Declarations

Acknowledgments

The authors are grateful to their colleagues at [institution] for the exchange of ideas during the drafting phase and to the anonymous reviewers whose comments have improved the paper.

Declaration of Interest

The authors confirm that they have no conflicts of interest to disclose.

Funding

The authors did not receive any financial support for the research, authorship, or publication of this article.

Data Availability Statement

The data that was analyzed in this systematic review came from previously published peer-reviewed articles, which are permanently available through the sources that have been cited. Extraction sheet and quality appraisal register can be obtained by contacting the corresponding author.

Declaration of Generative AI Use

During the writing process, the author(s) utilized generative AI technology only to refine the language. At no point did any AI tool create, substitute, or make major changes to the intellectual content, analysis, or interpretation. The author(s) always reviewed and revised the content after using these tools and take(s) full responsibility for the publication content

References

1. Alfianto AG, Wijayanti DP, Sulaksono AD, Choirullah AH, BASED PROGRAM FOR THE PSYCHOLOGICAL PREPAREDNESS OF ELEMENTARY SCHOOL STUDENTS (2024) Nurse Health Jurnal Keperawatan 13(1):148–155. https://doi.org/10.36720/nhjk.v13i1.657. DISASTER-SAFE-SCHOOL

2. Azirah N, Alhadi Z (2025) Faktor Pendukung dan Penghambat dalam Penerapan Pilar Fasilitas Sekolah Aman Bencana di Kecamatan Koto Tangah Kota Padang. YASIN 5(5):4731–4744. https://doi.org/10.58578/yasin.v5i5.6991
3. Bennett D (2020) Five Years Later: Assessing the Implementation of the Four Priorities of the Sendai Framework for Inclusion of People with Disabilities. Int J Disaster Risk Sci 11(2):155–166. https://doi.org/10.1007/s13753-020-00267-w
4. Boon H, Brown LH, Tsey K, Speare R, Pagliano P, Usher K, Clark B (2011) School disaster planning for children with disabilities a critical review of the literature. ResearchOnline James Cook Univ (James Cook University) 26(3):223–237
5. Boon H, Cottrell A, King D, Stevenson RB, Millar J (2011) Bronfenbrenner's bioecological theory for modelling community resilience to natural disasters. Nat Hazards 60(2):381–408. https://doi.org/10.1007/s11069-011-0021-4
6. Cabatay MM, Hermanto H, Aningrum R (2024) Contributing Factors to the Progress of Inclusive Education Implementation in Indonesia. INKLUSI 11(1):45–62. https://doi.org/10.14421/ijds.110103
7. Cabatay MM, Pujaningsih P, FACTO STUDY ON DISASTER PREVENTION AND RISK REDUCTION EDUCATION IMPLEMENTATION IN SPECIAL EDUCATION SCHOOLS IN INDONESIA (2025) IJIET (International J Indonesian Educ Teaching) 9(1):127–144. https://doi.org/10.24071/ijiet.v9i1.10199. AN EX POST
8. Drolet J (2024) *Intersectionality and Disasters* (pp. 33–46). https://doi.org/10.4324/9781003309208-4
9. Dwiningtias H, Pratama MR, Rohmansyah R, Puntodewo L, Rahman FA, Hiram TPBPS (2025) Inclusive Disaster Education for Students with Special Needs in Indonesia: A Case Study at SLB BC Harapan Ibu, Jakarta. CHATRA Jurnal Pendidikan Dan Pengajaran 3(2):120–130. https://doi.org/10.62238/chatra.v3i2.255
10. Edmonds C (2016) Designing Emergency Preparedness Resources for Children with Autism. Int J Disabil Dev Educ 64(4):404–419. https://doi.org/10.1080/1034912x.2016.1264577
11. Fu C, Underwood C (2015) A meta-review of school-based disaster interventions for child and adolescent survivors. J Child Adolesc Mental Health 27(3):161–171. https://doi.org/10.2989/17280583.2015.1117978
12. Greca AML, Silverman WK (2009) Treatment and Prevention of Posttraumatic Stress Reactions in Children and Adolescents Exposed to Disasters and Terrorism: What Is the Evidence? Child Dev Perspect 3(1):4–10. https://doi.org/10.1111/j.1750-8606.2008.00069.x
13. Hestyanti YR (2006) Children Survivors of the 2004 Tsunami in Aceh, Indonesia. Ann N Y Acad Sci 1094(1):303–307. https://doi.org/10.1196/annals.1376.039
14. Indriasari FN, Widyarani L, K PD (2018) Disaster Risk Reduction and Emergency Preparedness for Children With Autism in Facing Earthquake Disaster in Yogyakarta. JMMR (Jurnal Medicoeticolegal Dan Manajemen Rumah Sakit) 7(1). https://doi.org/10.18196/jmmr.7156

15. Isrona L, Yulistini, Mardhotillah F, Husna N, Fauzan M, Mujahidah I, Helery R, Yetti H, Indah R (2021) Monster VIPs: disaster preparedness training for children with intellectual disabilities. *E3S Web of Conferences*, *331*, 4008–4008. https://doi.org/10.1051/e3sconf/202133104008
16. Kawasaki H, Yamasaki S, Kurokawa M, Tamura H, Sonai K (2022) Relationship between Teachers' Awareness of Disaster Prevention and Concerns about Disaster Preparedness. Sustainability 14(13):8211–8211. https://doi.org/10.3390/su14138211
17. Kip A, Kurt G, Acartürk C, Hyland P, Churbaji D, Sander L (2025) Reflections on mental health research in post-disaster settings. PLOS Global Public Health 5(10). https://doi.org/10.1371/journal.pgph.0005312
18. Kurniawati F (2021) Exploring teachers' inclusive education strategies in rural Indonesian primary schools. Educational Res 63(2):198–211. https://doi.org/10.1080/00131881.2021.1915698
19. Lestari W, Dwiningrum SIA, Sujarwo S, Azhari I, Damanik I (2025) Evaluating the effectiveness of local wisdom-based disaster mitigation education in primary schools. Edelweiss Appl Sci Technol 9(5):2074–2091. https://doi.org/10.55214/25768484.v9i5.7380
20. Lieber M (2017) Assessing the Mental Health Impact of the 2011 Great Japan Earthquake, Tsunami, and Radiation Disaster on Elementary and Middle School Children in the Fukushima Prefecture of Japan. PLoS ONE 12(1). https://doi.org/10.1371/journal.pone.0170402
21. Macleod E, Kibukamusoke I, Seselja I, Heffernan T, Lane J, Walker IS, Greenwood L, Cruwys T, Calear AL (2025) Parental Resilience in a Bushfire to Pandemic Context: An Ecological Systems Approach. J Child Fam stud 34(12):3179–3194. https://doi.org/10.1007/s10826-025-03164-2
22. Mahoklory SS, Hoda FS (2021) The Effect of Self-Evacuation Drill on The Preparedness Level of Children with Disabilities in Facing Tornado Disaster. Jurnal Obsesi Jurnal Pendidikan Anak Usia Dini 6(3):1658–1666. https://doi.org/10.31004/obsesi.v6i3.1636
23. Mann M, McMillan J, Silver EJ, Stein REK (2021) Children and Adolescents with Disabilities and Exposure to Disasters, Terrorism, and the COVID-19 Pandemic: a Scoping Review. Curr Psychiatry Rep 23(12):80–80. https://doi.org/10.1007/s11920-021-01295-z
24. Marta DJ, Widana IDKK, Subiyanto A, Yoga AA (2025) The Concept of Disaster Education and the Roles of Educational Personnel, Parents, Partners, and Community in Early Childhood Education. J Early Child Educ Perspect 1(2):64–77. https://doi.org/10.64850/jecep.v1i2.142
25. Masten AS (2020) Resilience of children in disasters: A multisystem perspective. Int J Psychol 56(1):1–11. https://doi.org/10.1002/ijop.12737
26. Masten AS, Motti-Stefanidi F (2020) Multisystem Resilience for Children and Youth in Disaster: Reflections in the Context of COVID-19. Adversity Resil Sci 1(2):95–106. https://doi.org/10.1007/s42844-020-00010-w
27. Masten AS, Narayan AJ (2011) Child Development in the Context of Disaster, War, and Terrorism: Pathways of Risk and Resilience. Ann Rev Psychol 63(1):227–257. https://doi.org/10.1146/annurev-psych-120710-100356

28. Masten AS, Obradović J (2008) Disaster Preparation and Recovery: Lessons from Research on Resilience in Human Development. Ecol Soc 13(1). https://doi.org/10.5751/es-02282-130109
29. Muzani M, Fatimah AN, Imsa MA, Casmana AR (2022) The obstacles hierarchy of school disaster preparedness implementation in Mount Sinabung area, Indonesia. *Frontiers in Education*, *7*. https://doi.org/10.3389/feduc.2022.842990
30. Nopriyasman N, Asnan G, Fauzi A, Hastuti IP, Ritonga A, Kurniawan V, Mairiska R (2024) Reading indigenous signs: The wisdom of nagari communities toward natural disaster in Pasaman Barat. Int J Disaster Risk Reduct 107:104497–104497. https://doi.org/10.1016/j.ijdrr.2024.104497
31. Parrott E, Bernardino A, Lomeli-Rodriguez M, Burgess RA, Rahman A, Direzkia Y, Joffé H (2023) Community Resilience after Disasters: Exploring Teacher, Caregiver and Student Conceptualisations in Indonesia. Sustainability 16(1):73–73. https://doi.org/10.3390/su16010073
32. Parrott E, Lomeli-Rodriguez M, Burgess RA, Rahman A, Direzkia Y, Joffé H (2024) The Role of Teachers in Fostering Resilience After a Disaster in Indonesia. School Mental Health 17(1):118–136. https://doi.org/10.1007/s12310-024-09709-y
33. Peek L, Stough LM (2010) Children With Disabilities in the Context of Disaster: A Social Vulnerability Perspective. Child Dev 81(4):1260–1270. https://doi.org/10.1111/j.1467-8624.2010.01466.x
34. Pohan RA, Ramadhani E, Marimbun M, Chalidaziah W, Nengsih N, Marhaban M (2024) Disaster Preparedness and Safety Curriculum for Early Childhood Education in Indonesia. Prehosp Disaster Med 39(2):228–229. https://doi.org/10.1017/s1049023x24000177
35. Pratiwi PH, Dwiningrum SIA, Sumunar DRS (2023) Integrated Disaster Risk Management in the Education Process in Schools. IDRiM J 13(1). https://doi.org/10.5595/001c.91284
36. Renhoran CR, Yamanishi Y, Suyama N, Inoue K, Buwana C, Betty P, Ito Y (2026) Experiences of parents of children with disabilities for disaster preparedness in Indonesia: a descriptive qualitative study. Br J Occup Therapy. https://doi.org/10.1177/03080226261417204
37. Rizal E, Winoto Y, Sugito T, Nugroho C, Septian FI (2025) Disaster communication in the digital age: a community-based case study of media, education, and local knowledge in Pangandaran, Indonesia. *Frontiers in Communication*, *10*. https://doi.org/10.3389/fcomm.2025.1632436
38. Rofiah NH, Kawai N (2025) Integrating disability-inclusive disaster education in primary schools: A CASE from Yogyakarta, Indonesia. Progress Disaster Sci 28:100482–100482. https://doi.org/10.1016/j.pdisas.2025.100482
39. Rofiah NH, Kawai N, Hayati EN (2021) Key elements of disaster mitigation education in inclusive school setting in the Indonesian context. Jàmbá J Disaster Risk Stud 13(1):1159–1159. https://doi.org/10.4102/jamba.v13i1.1159
40. Rofiah NH, Kawai N, Hayati EN (2024) Disability-inclusive disaster risk reduction in schools: A confirmatory factor analysis. Jàmbá J Disaster Risk Stud 16(1):1559–1559. https://doi.org/10.4102/jamba.v16i1.1559
41. Rolfsnes ES, Idsøe T (2011) School-based intervention programs for PTSD symptoms: A review and meta-analysis. J Trauma Stress 24(2):155–165. https://doi.org/10.1002/jts.20622

42. Ronggowulan L, Wibowo YA, Saputro HD (2023) A policy review: are disaster safe schools in Pekalongan Regency necessary? *IOP Conference Series Earth and Environmental Science*, *1190*(1), 12029–12029. https://doi.org/10.1088/1755-1315/1190/1/012029
43. Ronoh S, Gaillard JC, Marlowe J (2015) Children with Disabilities and Disaster Risk Reduction: A Review. Int J Disaster Risk Sci 6(1):38–48. https://doi.org/10.1007/s13753-015-0042-9
44. Seyle DC, Widyatmoko CS, Silver RC (2013) Coping with natural disasters in Yogyakarta, Indonesia: A study of elementary school teachers. School Psychol Int 34(4):387–404. https://doi.org/10.1177/0143034312446889
45. Shah AA, Ye J, Lu P, Ullah R, Shah SIA, Fahad S, Naz S (2018) Schools' Flood Emergency Preparedness in Khyber Pakhtunkhwa Province, Pakistan. Int J Disaster Risk Sci 9(2):181–194. https://doi.org/10.1007/s13753-018-0175-8
46. Sheehy K, Vacková P, van Manen SM, Turnip SS, Rofiah K, Twiner A (2022) Inclusive disaster risk reduction education for Indonesian children. Int J Incl Educ 28(11):2529–2545. https://doi.org/10.1080/13603116.2022.2115156
47. Somad A, Haryanto S, Darsinah D (2024) Inclusive Education for Special Needs Students in Indonesia: A Review of Policies, Practices and Challenges. JMKSP (Jurnal Manajemen Kepemimpinan Dan Supervisi Pendidikan) 9(2):1024–1035. https://doi.org/10.31851/jmksp.v9i2.16192
48. Triastari I, Dwiningrum SIA, Rahmia SH (2021) Developing Disaster Mitigation Education with Local Wisdom: Exemplified in Indonesia Schools. *IOP Conference Series Earth and Environmental Science*, *884*(1), 12004–12004. https://doi.org/10.1088/1755-1315/884/1/012004
49. Utama WWI, Rahayu W, Hapidin (2024) Study Mitigation Disaster for Early Childhood in Indonesia: A Systematic Literature Review. Evolutionary Stud Imaginative Cult 705–716. https://doi.org/10.70082/esiculture.vi.725
50. Utami AAN, Dwiastuti AN, Nurmalasari Y (2024) Achievement of safer learning facilities standards in the disaster safe education unit program at Panggang elementary school. FOUNDASIA 15(1). https://doi.org/10.21831/foundasia.v15i1.77058
51. Widyatmoko CS, Tan ET, Seyle DC, Mayawati EH, Silver RC (2011) Coping with natural disasters in Yogyakarta, Indonesia: The psychological state of elementary school children as assessed by their teachers. School Psychol Int 32(5):484–497. https://doi.org/10.1177/0143034311402919
52. Winangsih I, Kurniati E (2020) *Disaster Mitigation in Early Childhood Education*. https://doi.org/10.2991/assehr.k.200808.058
53. Yuwanto L, Adi CMP, Budiman AF (2017) Disaster Education Based on Psychological First-Aid for Students: Increasing Capacity Dealing With Disaster. US-China Educ Rev B 7(5). https://doi.org/10.17265/2161-6248/2017.05.005

Figures

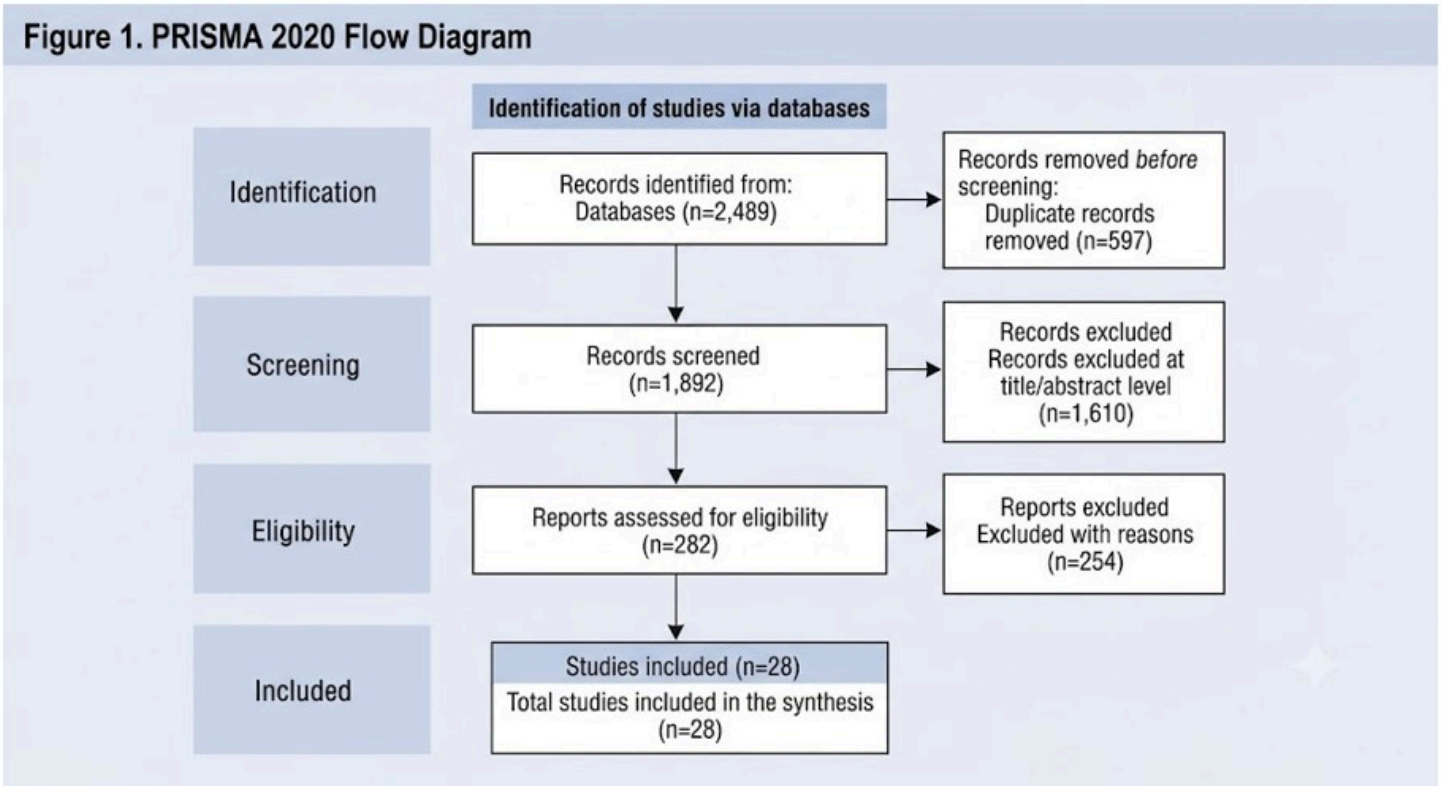


Figure 1

PRISMA 2020 Flow Diagram.

Identification (n=2,489) → Deduplication (n=597 removed) → Records screened (n=1,892) → Excluded at title/abstract (n=1,610) → Full-text assessed (n=282) → Excluded with reasons (n=254) → Studies included (n=28).

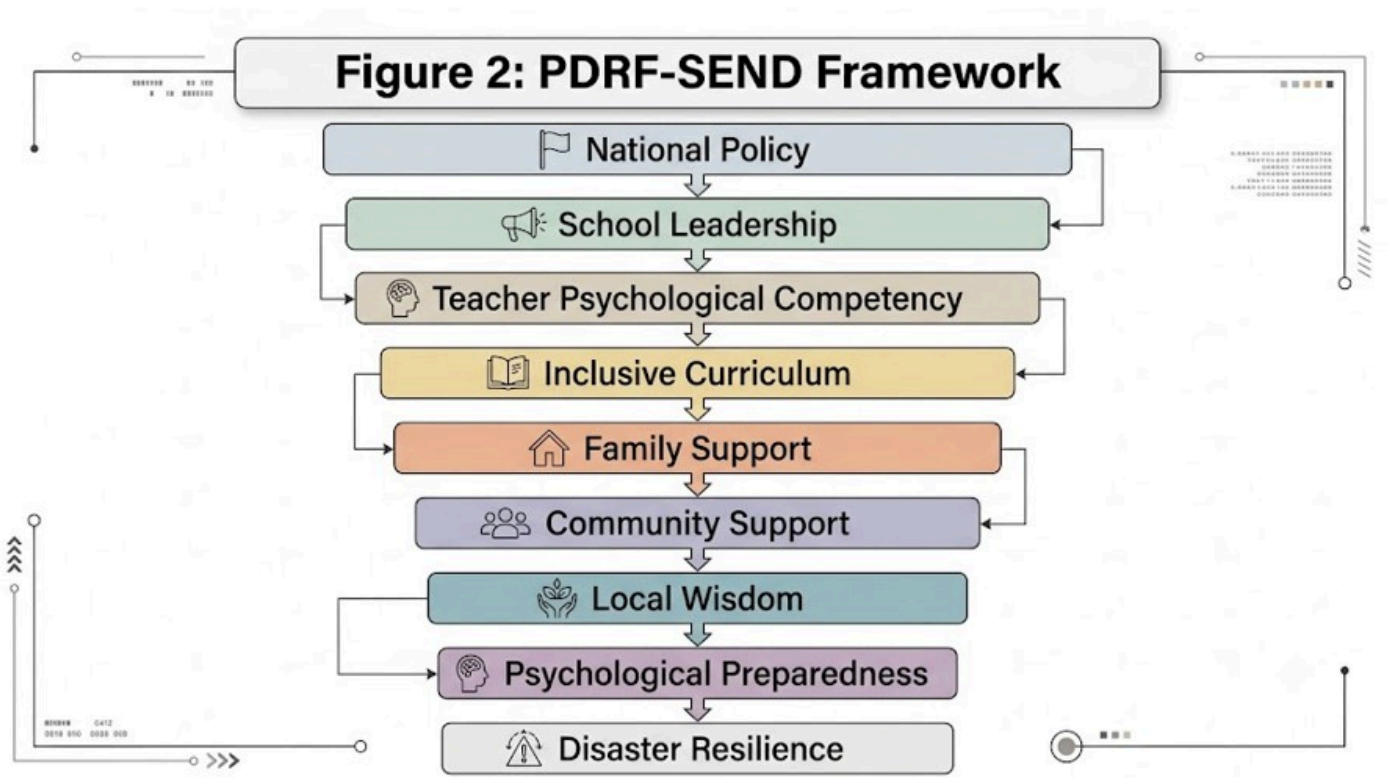


Figure 2

PDRF-SEND Framework.

Cascading architecture: National Policy → School Leadership → Teacher Psychological Competency → Inclusive Curriculum → Family Support → Community Support → Local Wisdom → Psychological Preparedness → Disaster Resilience.