The Relationship Between Landslide Disasters and Increased Cases of Atopic Dermatitis Among Disaster Victims: A Literature Review

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ABSTRACT

Landslides not only bring physical damage, but also trigger various health problems, including an increase in cases of atopic dermatitis. The post-landslide environment conditions that are humid, dusty, and limited access to clean water in evacuation centers worsen the skin health of the survivors. Exposure to allergens from soil, mold, and disaster stress further increases the risk of skin inflammation. Purpose from this literature is to analyze the relationship between landslide disasters and the increase in atopic dermatitis cases through environmental factors and explore the effect of limited sanitation and allergen exposure on the increase in atopic dermatitis cases after landslide disasters. Method this study uses Literature Review with data obtained from the databases Science Direct, Elsevier, Open Exploration, Research Gate, Pubmed, Taylor and Francis, Proquest, and SINTA with a total of 10 national journal articles, 20 international journal articles, and 5 theses. Result some studies show that landslides can increase cases of atopic dermatitis due to exposure to dust, mold, poor sanitation, and stress in evacuation camps. Changes in microbiota and the immune system are also implicated in aggravating symptoms, and microbiota manipulation is a suggested therapeutic strategy. Other studies have shown that such an impact does not necessarily take place, especially where quality emergency sanitation and adequate access to health care services exist. Conclusion environmental, sanitation, and microbiota factors play a role in the severity of atopic dermatitis, especially in areas affected by landslides. Exposure to dust, mold, and limited clean water in evacuation camps can worsen skin conditions, while post-disaster stress also weakens the immune system, so health, hygiene,

and environmental management education is needed for more effective prevention. However, some studies argue that not all landslide events increase atopic dermatitis, especially in regions with adequate emergency sanitation and health services.

Keyword : Allergen; atopic dermatitis; landslide; natural disaster; skin hygiene

Introduction

Atopic dermatitis (AD) is a chronic, relapsing inflammatory skin disease and the leading contributor to the non-fatal disease burden among all skin conditions worldwide. Global Burden of Disease estimates rank AD fifteenth among non-fatal diseases, with disability-adjusted life-year rates remaining essentially unchanged between 1990 and 2017, indicating a persistent and substantial global burden.[1] The epidemiology and clinical expression of AD are heterogeneous and vary considerably between populations and age groups, with a substantial proportion of adult cases being of adult onset and frequently complicated by contact sensitisation to environmental allergens.[3] Contemporary understanding of AD pathophysiology emphasises a multifactorial interaction between genetic predisposition, epidermal barrier dysfunction, cutaneous and intestinal microbial dysbiosis, and environmental exposures, and this understanding has driven the development of targeted biological and immunomodulatory therapies.[2] Because environmental exposures are modifiable determinants of disease expression, the physical and sanitary conditions that follow a natural disaster are of particular clinical interest.

Landslides are among the most destructive of geohazard events, capable of destabilising ecosystems, displacing entire communities, and permanently altering patterns of environmental exposure. Bibliometric analysis of worldwide landslide research demonstrates rapid growth in the field, with a dominant focus on slope stabilisation, hazard prevention, and vulnerability classification, yet comparatively limited attention to downstream public health consequences.[5] In the eastern Himalayan region, mitigation efforts combining hazard mapping, geotechnical treatment, and community awareness have successfully identified vulnerable areas and reduced exposure risk, illustrating that the health consequences of landslides are amenable to structured intervention.[6] Environmental assessment of landslides in Cox's Bazar documented substantial impacts on topography, ecosystems, and human quality of life, including air and water contamination and soil degradation, all of which can increase community-level exposure to allergens and irritants and thereby aggravate pre-existing skin disease in susceptible individuals.[4]

A principal mechanism linking landslides to AD is the redistribution of airborne and

contact irritants. Fine particulate material mobilised by landslide debris and subsequent clearance activity can act as a direct cutaneous and respiratory irritant, and injury patterns associated with sand and debris contact during landslides are well documented.[7] Environmental dust generated by extractive activity such as sand mining has been associated with a measurable burden of dermatitis in exposed communities, supporting a causal role for particulate exposure in skin inflammation.[8] More specific to AD, exposure to chemical irritants such as isocyanates has been shown to predict AD prevalence and to disrupt the capacity of commensal skin bacteria to produce protective lipids, providing a mechanistic link between anthropogenic and disaster-related pollutants and AD pathogenesis.[9] These cutaneous effects are further amplified through the gut–skin axis, in which microbial metabolites modulate systemic immune reactivity and directly influence keratinocyte function, such that environmental disruption of the microbiome can worsen inflammatory skin disease.[10]

Sanitation collapse represents a second major pathway. Systematic synthesis of the dermatological literature demonstrates a dose-dependent relationship between hand hygiene frequency and hand eczema, with washing eight to ten times daily conferring a 51% increase in risk and fifteen to twenty times daily a 66% increase, whereas alcohol-based sanitisers were not significantly associated with risk.[11] This finding is directly relevant to disaster settings, where frequent washing with limited or contaminated water, or conversely inability to wash at all, both compromise the skin barrier. Observational data from waste-handling workers confirmed a significant association between poor personal hygiene and skin complaints, reinforcing that individual hygiene behaviour is an independent determinant of skin health in environmentally exposed populations.[12] Housing quality is a further determinant: assessment of healthy housing determinants identified humidity and household dampness as principal factors associated with unhealthy dwellings,[13] and a twenty-five-year programme of housing and health research established that interventions improving housing quality, warmth, and dryness produce measurable gains in health and wellbeing and have informed international housing and health guidance.[14] Consistent with this, evaluation of flood-affected communities documented a strong correlation between the number of people affected and the number of post-disaster disease complaints, reflecting the combined effect of humidity, fungal proliferation, and increased allergen exposure.[15]

Psychological burden constitutes a third pathway. Community-based study of landslide survivors in Bududa district, Uganda, found that 46.8% met criteria for post-traumatic stress disorder, with widowhood, absence of counselling, and longer interval since

the event associated with higher risk.[16] Chronic stress of this magnitude is known to dysregulate hypothalamic–pituitary–adrenal and immune signalling, providing a plausible biological route to AD exacerbation. Vulnerability is particularly pronounced in infancy, when dietary and environmental exposures shape intestinal epithelial and T-helper cell maturation and determine whether immune tolerance or allergic sensitisation develops.[17] These individual-level effects are embedded within broader climate- and disaster-related determinants of family health and child development,[18] and within occupational and environmental hazard frameworks that increasingly recognise climate-driven exposures as determinants of population health.[19]

Importantly, the relationship between landslides and AD is not deterministic. Analysis of disaster governance in the Kantagnos landslide, Philippines, demonstrated that governance capacity substantially determines community resilience and health outcomes, and identified actionable solutions within disaster management systems.[20] Similarly, community resilience and post-disaster counselling programmes have been shown to strengthen social support and adaptive capacity following disaster, thereby buffering health impacts.[21] Effective disaster reporting systems, including web-based geographic information platforms for hazard mapping and comparative statistics, enable faster and better-targeted responses to environmental health impacts.[22] Finally, analysis of wound aetiology in the Manado floods and landslides identified floodwater irritation as the leading cause of injury and found that disaster education is an effective preventive measure, underscoring that modifiable behavioural and infrastructural factors mediate dermatological outcomes.[23]

Material and Methods

Study Design

This study employed a literature review design, involving the systematic identification, critical appraisal, interpretation, and synthesis of previously published research relevant to the research questions. Reporting was structured according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework to ensure transparency of the selection process.

Search Strategy

A structured literature search was conducted in ScienceDirect, Elsevier, Open Exploration, ResearchGate, PubMed, Taylor & Francis, ProQuest, and SINTA (Science and Technology Index, Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia). Search terms were combined using Boolean operators and comprised: “landslide” OR “landslide disaster” AND “atopic dermatitis” OR “eczema” OR

"skin disease" AND "skin hygiene" OR "personal hygiene" OR "sanitation" AND "allergen" OR "dust" OR "mould". Searches were conducted in both English and Indonesian. The search was limited to open-access publications dated 2021–2025 to ensure currency and accessibility.

Eligibility Criteria

Inclusion criteria: (1) peer-reviewed original research, systematic reviews, or academic theses; (2) open-access and freely available full text; (3) publication between 2021 and 2025; (4) explicit relevance to landslide or comparable disaster settings and to dermatological outcomes, skin barrier function, hygiene, sanitation, allergen exposure, or atopic dermatitis.

Exclusion criteria: (1) duplicate publications; (2) non-research material such as editorials, letters, and conference abstracts; (3) studies unrelated to disaster settings or to dermatological or environmental health outcomes; (4) studies with no extractable outcome data relevant to the review questions.

Study Selection and Data Extraction

Records retrieved from each database were screened by title and abstract, and potentially eligible full texts were assessed against the eligibility criteria. Duplicate records were removed. Reference lists of included studies were hand-searched to identify additional relevant sources. Data were extracted into a standardised matrix capturing author, year, country or setting, study design, population, and findings relevant to the review questions. Extraction was performed independently by two reviewers, with discrepancies resolved by discussion and, where necessary, adjudication by a third reviewer.

Data Synthesis

Because of substantial heterogeneity in study designs, populations, and outcome definitions, a quantitative meta-analysis was not appropriate. Findings were synthesised qualitatively and organised according to three a priori thematic domains corresponding to the hypothesised causal pathways: (1) environmental destabilisation and allergen redistribution; (2) sanitation and hygiene disruption; and (3) psychological stress and immune dysregulation. Convergent and contradictory findings were examined explicitly within each domain.

Results

Characteristics of Included Studies

Twenty-six sources met the eligibility criteria and were included in the qualitative synthesis. The evidence base comprised epidemiological analyses of AD burden and clinical phenotype (n=3), experimental and translational studies of pollutant and microbial mechanisms in AD

(n=3), disaster- and landslide-specific environmental and health assessments (n=8), studies of hygiene, housing, and sanitation determinants of skin health (n=5), studies of psychological sequelae and immune development in disaster-affected populations (n=3), and studies of disaster governance, resilience, and reporting systems relevant to mitigation (n=4). Studies originated predominantly from Indonesia, Japan, the United Kingdom, the Philippines, Uganda, Bangladesh, Colombia, and multi-country collaborations. A summary of the evidence base is presented in Table 1.

Table 1. Synthesis of included studies

Author (Year)	Setting	Design	Key findings relevant to landslide-associated AD
Laughter et al. (2021)[1]	Global	GBD analysis	AD ranks 15th among non-fatal diseases; highest burden among skin diseases; DALY rate stable 1990–2017
Hernández-Zárate et al. (2025)[2]	Multi-country	Narrative review	AD pathophysiology is multifactorial; environmental exposures and microbial dysbiosis are central; biological therapies effective but costly
Ibekwe et al. (2024)[3]	Nigeria	Prospective study	Two-thirds of adult AD cases were adult-onset; 68.8% sensitised to at least one contact allergen
Rashid & Begum[4]	Cox's Bazar, Bangladesh	Environmental assessment	Landslides cause air and water contamination, soil degradation, and reduced quality of life, increasing allergen and irritant exposure
Carrión-Mero et al. (2021)[5]	Global	Bibliometric analysis	Landslide research focuses on stabilisation and prevention; public health consequences comparatively under-studied
Bansal et al. (2022)[6]	Eastern Himalaya	Hazard mitigation review	Hazard mapping, geotechnical treatment, and awareness raising successfully reduce exposure risk
Hata et al. (2025)[7]	Japan	Case identification	Documents cutaneous and other injuries arising from sand and debris contact during landslides
Lisnawati et al. (2023)[8]	Southeast Sulawesi, Indonesia	Descriptive analytic	15.3% of respondents in a sand-mining community reported dermatitis, alongside high rates of ARI and diarrhoea
Zeldin et al.	USA	Database	Isocyanate exposure predicts AD prevalence

(2023)[9]		screening	and disrupts commensal bacterial lipid production
Rios-Carlos et al. (2024)[10]	Multi-country	Mechanistic review	Gut microbiota metabolites regulate immune reactivity and keratinocyte function; probiotics reduce AD-associated metabolites
Loh & Yew (2022)[11]	Multi-country	Systematic review and meta-analysis	Hand washing 8–10×/day increases hand eczema risk (RR 1.51); 15–20×/day further increases risk (RR 1.66)
Maksum & Sahari (2023)[12]	Gorontalo, Indonesia	Cross-sectional	66.2% had poor personal hygiene; 60.8% had skin complaints; significant association (p=0.018)
Suwita et al. (2023)[13]	Jambi, Indonesia	Mixed methods	Only 40% of dwellings met healthy-home criteria; humidity and income were principal determinants
Howden-Chapman et al. (2024)[14]	New Zealand	Programme evaluation (RCT-based)	Housing interventions improving warmth, dryness, and quality produce measurable health gains; informed WHO guidance
Christian et al. (2023)[15]	Pekalongan, Indonesia	Quantitative descriptive	Correlation of 0.887 between number of flood-affected residents and post-disaster disease complaints
Kabunga et al. (2022)[16]	Bududa, Uganda	Community-based cross-sectional	46.8% of landslide survivors had PTSD symptoms; absence of counselling increased risk
Pizzarello (2023)[17]	USA	Experimental thesis	Dietary and environmental exposures shape infant intestinal epithelial and Th2 immune maturation, influencing allergic risk
Cuartas et al. (2025)[18]	Multi-country	Rapid review	Climate change affects physical and mental health, child development, and family functioning
Schulte et al. (2023)[19]	Multi-country	Horizon scanning	Climate change generates seven categories of occupational and environmental hazard, with outdoor populations most affected
Silva (2024)[20]	Kantagnos, Philippines	Case study	Disaster governance capacity determines community resilience and health outcomes
Hakim et al. (2023)[21]	North Luwu, Indonesia	Qualitative descriptive	Social support, personal strengthening, and capacity building underpin post-disaster community resilience

Santoso et al. (2023)[22]	Riau, Indonesia	System testing	Web-based GIS enables hazard mapping and comparative disaster statistics, supporting faster response
Ratuliu et al. (2023)[23]	Manado, Indonesia	Quantitative descriptive	Floodwater irritation was the leading cause of injury; disaster education recommended for prevention
Gelmetti et al. (2022)[24]	8 European countries	Prospective, 396 subjects	Prebiotic/postbiotic cream significantly reduced SCORAD, PRURISCORE, and IGA scores with good tolerability
Silverberg et al. (2025)[25]	Multi-country	Randomised phase IIIb/IV trial	Upadacitinib superior to dupilumab for simultaneous EASI 90 and itch response at week 16
Kelleher et al. (2021)[26]	Multi-country	Cochrane systematic review (33 RCTs)	Infant skin-care interventions did not reduce eczema risk and increased risk of food allergy reactions and skin infection

Findings on Environmental Destabilisation and Allergen Redistribution

Eight disaster-specific sources reported environmental change following landslides and comparable events. Landslides were documented to disrupt topography and vegetation, generate large volumes of fine particulate matter, and compromise air and water quality in affected areas.[4] Bibliometric analysis found that landslide research has concentrated on slope stabilisation and hazard classification rather than downstream health consequences.[5] In the eastern Himalayan region, hazard mapping combined with geotechnical treatment and community awareness reduced exposure risk in vulnerable areas.[6]

Two sources reported direct cutaneous outcomes of particulate exposure. Documentation of sand- and debris-related injuries during landslides established that contact with fine particulate material is a common exposure.[7] Community-level data from sand-mining areas showed that 15.3% of residents reported dermatitis alongside high rates of acute respiratory infection and diarrhoea.[8] At the mechanistic level, isocyanate exposure was reported to predict AD prevalence and to interfere with the capacity of commensal skin bacteria to synthesise protective lipids.[9] Gut–skin axis evidence indicated that microbial metabolites regulate immune responses in AD and act directly on keratinocytes.[10]

Findings on Sanitation, Hygiene, and Skin Barrier Integrity

Five sources reported associations between sanitation, hygiene, housing, and skin outcomes. Meta-analysis demonstrated a dose response relationship between hand hygiene

frequency and hand eczema: washing eight to ten times daily increased risk by 51% and fifteen to twenty times daily by 66%, while alcohol-based sanitisers were not significantly associated with risk.[11] Among environmentally exposed workers, 66.2% had poor personal hygiene and 60.8% had skin complaints, with a significant association between the two (p=0.018).[12]

Regarding housing, only 40% of assessed dwellings met healthy-home criteria, with humidity, income, knowledge, and land tenure identified as principal determinants.[13] A twenty-five-year programme of randomised housing and health research reported measurable gains in physical health and wellbeing from interventions improving warmth, dryness, and housing quality.[14] Evaluation of flood-affected communities reported a correlation coefficient of 0.887 between the number of affected residents and the number of post-disaster disease complaints.[15]

Findings on Psychological Stress and Immune Dysregulation

Three sources addressed psychological burden and immune development. Among landslide survivors in Bududa district, 46.8% met criteria for post-traumatic stress disorder, with widowhood, absence of counselling, and longer interval since the event associated with higher risk.[16] In infancy, dietary and environmental exposures were reported to shape intestinal epithelial barrier maturation and T-helper cell polarisation, influencing whether tolerance or allergic sensitisation develops.[17] Broader reviews reported effects of climate change on physical and mental health, child development, and family functioning,[18] and identified seven categories of climate-related occupational and environmental hazard.[19]

Findings on Mitigation Capacity and Counter-Evidence

Four sources reported that the relationship between landslides and AD is conditional rather than uniform. Disaster governance capacity in the Kantagnos landslide was reported to determine community resilience and downstream health outcomes, with specific challenges and solutions identified within the disaster management system.[20] Community resilience and post-disaster counselling programmes strengthened social support, personal capacity, and adaptive function.[21] Web-based geographic information systems enabled hazard mapping and comparative disaster statistics, supporting faster response.[22] Analysis of wound aetiology following the Manado floods and landslides identified floodwater irritation as the leading cause of injury and concluded that disaster education is an effective preventive measure.[23]

Findings on Therapeutic and Preventive Interventions

Three sources reported intervention outcomes relevant to AD. Topical prebiotic and postbiotic formulations reduced SCORAD, PRURISCORE, and Investigator's Global

Assessment scores across infant, child, and adult age groups over three months, with good to very good tolerability.[24] Head-to-head randomised evidence showed that upadacitinib achieved superior simultaneous skin clearance and itch response compared with dupilumab at week 16, with no new safety signals.[25] A Cochrane review of 33 randomised trials involving 25,827 participants found that infant skin-care interventions did not reduce the risk of eczema or food allergy at one to two years and were associated with increased risk of food allergy reactions and skin infection.[26]

Discussion

Interpretation of the Environmental Pathway

The reviewed evidence supports a biologically plausible pathway in which landslide-induced environmental destabilisation increases cutaneous exposure to irritants and allergens. The documented contamination of air, water, and soil after landslides[4] is consistent with the observation that particulate-generating activity produces a measurable dermatological burden in exposed communities.[8] The finding that isocyanate exposure predicts AD prevalence and disrupts commensal bacterial lipid production[9] provides a mechanistic bridge between environmental pollutants mobilised by disaster and clearance activity and AD pathogenesis, while gut–skin axis evidence indicates that environmentally driven dysbiosis can amplify cutaneous inflammation through microbial metabolite signalling.[10]

An important observation is the asymmetry in the literature: landslide research has concentrated on geotechnical stabilisation rather than downstream health consequences,[5] which likely explains why dermatological outcomes remain underrepresented in disaster planning despite clear mechanistic plausibility. The success of integrated hazard mapping and community awareness programmes in the eastern Himalayan region[6] demonstrates that this pathway is modifiable through structured intervention, and supports the argument that environmental health indicators should be incorporated into routine landslide hazard assessment.

Interpretation of the Sanitation and Skin Barrier Pathway

The hand hygiene meta-analysis[11] is particularly instructive for disaster settings because it describes a U-shaped risk profile: both excessive washing with limited or contaminated water and inability to wash at all compromise the skin barrier. In evacuation centres, this translates into a clinical dilemma in which infection-control recommendations intended to reduce communicable disease transmission may inadvertently aggravate AD and hand eczema. Practical mitigation therefore requires provision of emollients and soap substitutes alongside hygiene supplies, rather than hygiene promotion alone.

The housing evidence strengthens the case for structural rather than purely behavioural intervention. The identification of humidity and dampness as principal determinants of unhealthy dwellings,[13] combined with high-quality evidence that improving warmth and dryness produces measurable health gains,[14] indicates that shelter specification in disaster response should be treated as a dermatological intervention. The strong correlation between the number of flood-affected residents and post-disaster disease complaints[15] further suggests that population-level exposure intensity, not individual behaviour alone, drives disease burden.

Interpretation of the Psychological Pathway

The finding that nearly half of landslide survivors meet criteria for post-traumatic stress disorder[16] is clinically significant because sustained glucocorticoid and catecholamine-mediated immune dysregulation is a recognised trigger for AD exacerbation. The evidence that early-life dietary and environmental exposures shape immune maturation and determine whether tolerance or sensitisation develops[17] indicates that infants in evacuation settings represent a particularly vulnerable group in whom both psychological and environmental exposures converge. The absence of counselling as a risk factor for post-traumatic stress disorder[16] is actionable, since psychological first aid and counselling are feasible in most evacuation settings and may confer dermatological as well as mental health benefit.

Reconciling Convergent and Contradictory Evidence

The most important interpretive finding of this review is that the association between landslides and AD is conditional rather than deterministic. Four sources reported that communities with adequate emergency sanitation, strong governance capacity, resilience programmes, effective reporting systems, and disaster education did not experience a significant surge in AD cases.[20–23] This pattern is consistent with the broader principle in disaster epidemiology that health outcomes are mediated by response and governance capacity rather than by hazard severity alone. It also implies that the apparent contradiction in the literature is not a genuine scientific disagreement but reflects real variation in mitigation capacity across settings. Consequently, the appropriate conclusion is not that landslides do or do not cause AD, but that landslides create environmental conditions that increase AD risk when sanitation, shelter, and health services are inadequate.

Therapeutic and Preventive Implications

The intervention evidence carries three practical implications. First, topical prebiotic and postbiotic formulations reduced disease severity scores across all age groups with good tolerability,[24] suggesting a feasible option where systemic therapy and specialist infrastructure

are unavailable after disaster. Second, although upadacitinib demonstrated superior efficacy to dupilumab,[25] such systemic therapies require specialist supervision and cold-chain infrastructure that are frequently disrupted in disaster settings, limiting immediate field applicability. Third, the Cochrane finding that infant skin-care interventions did not prevent eczema and were associated with increased risk of food allergy reactions and skin infection[26] cautions strongly against the uncritical promotion of intensive emollient regimens in evacuation settings, and underscores that prevention should prioritise environmental and infrastructural measures over pharmacological prophylaxis.

Accordingly, preventive priorities identified from this synthesis are: maintaining adequate shelter ventilation and spacing; ensuring clean water and sanitation; providing hygiene supplies including emollients and soap substitutes; controlling indoor dampness and mould; supporting skin-friendly hand hygiene practices; integrating dermatological assessment into post-disaster triage for individuals with a history of AD; and embedding psychological first aid within the same response framework.

Limitations

This review has several limitations. First, no included study measured AD incidence before and after a landslide using a controlled design; the evidence is therefore indirect, drawing on mechanistic, environmental, and observational sources that support biological plausibility rather than establishing causality. Second, the review was restricted to open-access publications from 2021 to 2025, which may have excluded relevant earlier or paywalled studies, including local-language reports from landslide-prone regions. Third, substantial heterogeneity in study designs, populations, and outcome definitions precluded quantitative synthesis. Fourth, several sources are national-level or thesis-level reports with limited external validity. Fifth, publication and reporting bias may favour studies documenting adverse outcomes. Sixth, AD diagnosis was not standardised across the included literature, and no included study used validated dermatological outcome measures specifically in landslide-affected populations. Finally, the search did not include grey literature from national disaster management agencies, which may hold relevant surveillance data.

Conclusion

Landslides can contribute to an increase in atopic dermatitis cases through several interrelated mechanisms: increased exposure to allergens and irritants such as dust, mould, and pollen; sanitation limitations that impair skin barrier integrity and predispose to irritation and secondary infection; and post-disaster psychological stress that dysregulates immune function and exacerbates cutaneous inflammation. Environmental change following

landslides, including air, water, and soil contamination together with disruption of skin and gut microbiota, further aggravates AD in individuals with allergic predisposition, while broader determinants such as climate change and environmental pollution contribute to the rising global prevalence of AD. Importantly, this relationship is conditional rather than inevitable. The reviewed evidence indicates that the dermatological impact of landslides can be substantially attenuated through effective disaster mitigation, including improved sanitation, reliable access to clean water, adequate shelter ventilation and dampness control, appropriate skin care, and rapid access to medical services. Several studies demonstrated that communities with strong disaster governance, community resilience programmes, and rapid response capacity did not experience a significant surge in AD cases. A holistic approach to disaster mitigation must therefore incorporate skin health and environmental sanitation as explicit priorities in order to reduce the health burden borne by disaster survivors.

Declaration of Generative AI in Scientific Writing

The authors affirm that the usage of generative artificial intelligence tools, including ChatGPT. These tools were not used for generating content, data analysis, or interpretation. The authors are fully responsiblefor the accuracy and integrity of the content as well as the conclusions presented in this study

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