Jurnal Ners

Volume 21 Issue 2, May 2026, p. 139-149
http://dx.doi.org/10.20473/jn.v21i2.79911

Original Article

Open Access

Predictors of physical, psychological, and social vulnerability of cardiovascular emergencies prevention in disaster-prone communities: A cross-sectional study

Riza Fikriana[1]*, Dedi Kurniawan[1], and Al Afik[2]

[1] Universitas Kepanjen, Malang, Indonesia

[2] Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia

*Correspondence: Riza Fikriana. Address: Universitas Kepanjen, Malang, Indonesia. Email: riza_fikriana@universitaskepanjen.ac.id

Responsible Editor: Rifky Octavia Pradipta

Received: 6 October 2025○ Revised: 24 March 2026 ○ Accepted: 1 April 2026

ABSTRACT

Introduction: Cardiovascular emergencies are the leading cause of death worldwide. In disaster-prone areas, this condition can increase because people are at risk of experiencing stress due to disasters. This study aimed to analyze the predictors of physical, psychological, and social vulnerability factors for the prevention of cardiovascular emergencies.

Methods: This was a cross-sectional study. A total of 150 respondents with high-risk criteria for cardiovascular diseases and living in disaster-prone areas in West Sumbawa, Indonesia, were selected using the accidental sampling technique. The variables in this study were human resource preparedness, infrastructure readiness, availability of policy systems, access system readiness, and physical, psychological, and social vulnerability. Data were collected via questionnaires and analyzed using Fisher's exact test and binary logistic regression ($\alpha<0.05$).

Results: Economic status and social support from health workers and family members were associated with all vulnerability domains. Good economic status was significantly related to reduced physical (OR=0.075;95% CI=0.023–0.250) and social vulnerability (OR=0.052;95% CI=0.011–0.250), while low economic status was related to increased psychological vulnerability (OR=2.459;95% CI=1.022–5.917). Health worker support was a critical protective factor against physical vulnerability (OR=0.042;95% CI=0.004–0.476), and family support strongly mitigated social vulnerability (OR=0.080;95% CI=0.018–0.352).

Conclusions: Socioeconomic stability and interpersonal support systems are related to reducing health vulnerability in cardiovascular emergencies. Interventions should prioritize strengthening household economic resilience, enhancing family based psychosocial support, and integrating trained health workers into disaster preparedness frameworks to improve cardiovascular outcomes in pregnant women.

Keywords: cardiovascular emergencies, disaster-prone areas, physical vulnerability, psychological vulnerability, social vulnerability

Introduction

Indonesia is an archipelagic country on the Ring of Fire and has the potential for periodic disasters (Ramdani, Setiani and Setiawati, 2019). According to data from the National Disaster Management Agency, the total number of disasters that occurred in Indonesia in 2024 was 3,472 events spread across Indonesian territory with variants of natural disaster events in the form of earthquakes, volcanic eruptions, floods, forest and wilderness fires, extreme weather, landslides, droughts, tidal waves and abrasion. Natural disasters significantly affect public health systems (BNPB 2024). In addition, it results in the emergence of various complex challenges, such as damage to infrastructure and infrastructure facilities that limit the ability to access health services in the community (O'Connor, Thayer and Vedhara, 2021; Kourtit, Nijkamp and Banica, 2023; Aksa, Ashar and Siswanto, 2024)

Some of the deepest regions in Indonesia face the highest risks, where access to health facility services becomes very limited. This condition worsens efforts to handle health and emergencies that occur (Wahidin *et al.*, 2022; Tjitrawati and Romadhona, 2023; Haksama *et al.*, 2025). In disaster areas, many individuals experience increased health vulnerability (Fatema, 2020). The results of previous studies showed that in post-natural disaster evacuation areas, emergency cases occurred in the community. One of the most common cardiovascular emergencies is increased heart attacks, heart failure, hypertensive crises, arrhythmias, and cardiomyopathy stress. (Hayman *et al.*, 2015) These condition makes one of the leading cause of death globally (Fikriana and Afik, 2023; Fikriana, Afik and Aditya, 2025).

The existence of a disaster causes people to become stressed, especially in the case of a long evacuation process. This increases blood pressure (Yamaoka-Tojo and Tojo, 2024). Disaster hypertension, refers to the form of raised blood pressure levels (>140/90 mmHg) later a disaster, happens directly after a disaster. It was reported that there was an increase in systolic blood pressure by an average of 5-25 mmHg in 2-4 weeks after the disaster (Narita, Hoshide and Kario, 2021). In disaster conditions, a person who already suffers from hypertension is often unable to take medication. This aggravates the uncontrolled increase in blood pressure, which affects the occurrence of cardiovascular emergencies (Yamaoka-Tojo and Tojo, 2024). Based on data from the Health Crisis Center of the Ministry of Health of the Republic of Indonesia in 2021, there were 166 people with hypertensive crisis in the eruption area of Mount Semeru in Lumajang Regency (Indonesian Ministry of Health, 2021) . The high number of cardiovascular diseases has the potential to increase the incidence of post-disaster mortality. Other studies have also shown that the experience of earthquakes increases the risk factors for cardiovascular disease (heart and blood vessels) in the long term (Li *et al.*, 2017).

To date, the handling of emergency cardiology cases in specific evacuation areas has not been systematic, starting from initial screening, triage, hemodynamic interventions, and pharmacological and non-pharmacological management on an ongoing basis (Jaramillo *et al.*, 2019; Yiang *et al.*, 2021; Knack *et al.*, 2024). The results showed that among 6733 adults in the disaster-affected area, the risk of sudden cardiac arrest increased significantly after the disaster (Yamaoka-Tojo and Tojo, 2024). The initial screening stage is crucial for identifying and determining health risks that can occur in a person, especially in emergency conditions. By performing initial screening, the risk of emergency events can be minimized, and the outcome of a person's health status (Jaramillo *et al.*, 2019; Yiang *et al.*, 2021; Knack *et al.*, 2024). Early screening is part of the preparedness that must be had by the community to reduce the vulnerability and risk of heart and blood vessel emergencies (Laksmi, Susila and Suprapta, 2023)

Susceptibility to cardiovascular emergencies is determined not only by a person's biological condition but also by social, economic, and environmental factors. This is especially crucial for populations living in disaster-prone areas. People who live in disaster-prone areas experience not only physical vulnerability but also psychological and social vulnerability. People who live in disaster-prone areas have a high level of vulnerability to health problems when disasters occur. Problems that often arise are not only physical but also psychological and social. The results of the study show that mental health disorders, such as stress and depression, often occur after disasters. Vulnerable groups also face a higher risk of physical and mental health disorders (Kim, Kim and Kang, 2025). Cardiovascular disorders also increased after disasters. Disruption of access to treatment, physical and mental stress, and uncontrolled blood pressure are frequent problems that increase recurrence and the risk of emergencies (Babaie *et al.*, 2021).

Several studies related to cardiovascular emergency prevention efforts have been conducted; however, research focusing on people living in disaster-prone areas related to cardiovascular emergency prevention efforts and the vulnerability of physical, psychological, and social aspects that occur has not been widely conducted. Based on these conditions, researchers are interested in conducting research on factors that affect physical, psychological, and social vulnerability in cardiovascular emergency prevention efforts in people living in disaster-prone areas.

Materials and Methods

Study Design and Setting

This analytical cross-sectional study aimed to identify factors related to susceptibility to cardiovascular emergencies in adults living in disaster-prone areas. The research was conducted in West Sumbawa Regency, Indonesia, which is one of the areas with a high risk of natural disasters.

Population and Sample

The target population in this study is the entire adult population who live in disaster-prone areas and have risk factors for cardiovascular disease. The inclusion criteria set include (1) being ≥25 years old, (2) living in a disaster-prone area, (3) having at least one cardiovascular risk factor based on health and laboratory examination from medical record of patient such as blood pressure, blood glucose levels and blood cholesterol levels, (4) willing to give informed consent. Meanwhile, the exclusion criteria set include (1) unable to communicate due to severe cognitive or neurological impairment, (2) being in a medical emergency condition at the time of data collection, (3) being a temporary resident / not a

permanent resident. The number of research samples is determined based on the *rules of thumb formula*, which is 5-10 times the number of indicators (*observed variables*)(Lim, 2025). In this study, the number of observed variables was 14 indicators so that the minimum number of samples was 70 respondents. In this study, the number of samples used was 150. It was taken by accidental sampling technique. Sampling was carried out within two weeks at the Community Health Center on patients who made health check-up visits. Approximately 450 potential respondents were approached Assistance in data collection for patients is carried out by researchers and enumerators. The enumerator qualification was at least a diploma in health, preferably a nurse, experienced in screening and handling patients who have risk factors for cardiovascular disease, able to communicate well and fill out questionnaires accurately and able to maintain research ethics.

Variable and Research Instrument

The dependent variable in this study was susceptibility to cardiovascular emergencies, which consisted of physical, psychological, and social vulnerabilities. Measurement of physical and psychological vulnerability variables using modified statement questions from the Health Vulnerability Assessment Questionnaire (Ribeiro *et al.*, 2021). The statements in the research instrument were adjusted to the flood disaster conditions that occurred in the research area. Physical vulnerability measures the extent of healthy lifestyle behaviors, adherence to medication, and health check-ups. Psychological vulnerability measures the symptoms of anxiety and stress experienced by respondents. Meanwhile, social vulnerability was assessed using a modified statement question from the Health Vulnerability Questionnaire in Heart Failure (Lúcia *et al.*, 2025). Social vulnerability measures the perception that respondents have about support from family, friends/peers, and health workers. Each vulnerability domain consists of three questions. The answer choices for the vulnerability measurements were strongly disagreed (1), disagree (2), neutral (3), agree (4), and strongly agree (5). Next, the mean of each vulnerability domain was calculated. The mean obtained will be categorized into high and low with a cut-off point using a median. If the mean > median, it is categorized as "high vulnerability." If the mean<median, it is categorized as "low vulnerability".

The independent variables are cardiovascular emergency prevention factors that are suspected to affect physical, psychological, and social vulnerability in people living in disaster-prone areas. These factors include community capacity, experience, family support, health worker support, availability of health equipment and facilities, availability of referral services, availability of policies, policy implementation, economic status, availability of health insurance, and distance of health facilities. The measurement of these factors was modified from the Emergency Preparedness Survey of People with Disabilities (Chang, Villeneuve and Morris, 2020).

Community capacity is the ability of the community to know, plan, prepare and overcome health problems when a disaster occurs. Experience is a condition that has been carried out by the community in obtaining health information and treatment that has been carried out. Family and health worker support is the provision of assistance from families and health workers in the form of sharing health information and facilities needed to overcome health problems. Availability of health equipment and facilities is the availability of health equipment and physiology in an effort to overcome health problems. The availability of health insurance is a guarantee of getting access to financing health problems. The availability of policies is the existence or absence of policies known by the public about handling health problems. Policy implementation is the perception felt by the public about the implementation of policies that have been issued by the government. Economic status is the adequacy of income obtained and the ownership of savings to finance health problems. The distance of health service facilities is the perception of whether the house is far from the location of the clinic/public health center/hospital to get health services. Community capacity and health worker support have four question items, family support, availability of health equipment and facilities and policy implementation three question items, while experience, referral services, policy and economic status have two question items. The choice of answers using the likert scale starts from strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). The results of the answers are then calculated as mean. The mean obtained is divided into two categories of good and not good the basis of median. If the mean > median then the category is good, if the mean < median then the category is not good.

Data Collection

Data collection was carried out through direct interviews by asking the statements submitted by the researcher to the respondents using the prepared questionnaire guidelines. Respondents involved in this study signed an informed consent sheet as a form of consent to be involved in the research process. The questionnaire was based on a comprehensive literature review and expert consultation and was tested for validity and reliability. The validity test of the questionnaire was conducted on 20 samples. The validity and reliability values of the questionnaire were obtained. Cronbach's alpha values for the preparedness and vulnerability variables were 0.979 and 0.851, respectively.

Ethical Considerations

The research protocol was approved by the Health Research Ethics Committee of Kepanjen University (number 646/S). Ket/KEPK/UK/VI/2025. All participants were informed of the study objectives, procedures, potential risks, and their rights prior to enrollment and provided written informed consent. Participation was entirely voluntary, and participants could withdraw at any time without consequences to their access to health care services. Confidentiality was strictly maintained by anonymizing personal identifiers and storing the data in secure, password-protected systems accessible only to the research team. This study posed minimal risk. However, any potential discomfort during the interviews or measurements was mitigated by allowing the participants to skip questions or stop participating at any time. Additional safeguards were applied to protect vulnerable groups, including the elderly and individuals with limited health literacy, by providing clear information, allowing sufficient time for decision-making, and ensuring the absence of coercion in the healthcare setting.

Data Analysis

Data were entered into the SPSS Statistics software (Version 26.0, IBM Corp.) and cleaned for inconsistencies and missing values. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to characterize the sample and distribution of variables. Next, bivariate analysis was carried out to measure the association between each independent variable and the three vulnerability outcomes using the Fisher Exact Test. Furthermore, to determine the magnitude of the strength of the relationship, the Odds Ratio (OR) was calculated with 95% Confidence Intervals (CI) and p-values. Statistical significance was set at $p < 0.05$. To identify the most significant independent predictors, multiple binary logistic regression models were constructed for each vulnerability dimension (physical, psychological, and social). Variables with a p-value < 0.25 in the bivariate analysis were initially included in the multivariate model. A backward stepwise elimination procedure was then applied, retaining variables with $p < 0.05$ in the final model. Results are presented as Adjusted Odds Ratios (aOR) with 95% confidence intervals (CI.

Results

The results of the study presented an overview of the characteristics of the respondents, as well as the results of both bivariate and multivariate analyses related to cardiovascular emergency prevention factors that affect the status of physical, psychological, and social vulnerability in people living in disaster-prone areas.

Table 1 shows the frequency distribution of the demographic characteristics and health status of respondents living in disaster-prone areas. Based on the demographic characteristics of the respondents' age, it was found that the majority were in the productive age group to the early elderly. This shows that the study respondents were dominated by individuals in the age range at high risk for cardiovascular disease, where a higher proportion of women than men was obtained. The education level of the majority of respondents was relatively low to intermediate. Low levels of education can affect health literacy and the ability to recognize the early symptoms of cardiovascular emergencies. Most of the respondents worked as housewives, followed by self-employment. The dominance of housewives and the self-

Table 1. Frequency Distribution of Respondent Characteristics

Demographic and Health Status Characteristics	n	%
Age		
- 26 – 35 years old	13	8.7
- 36 – 45 years old	19	12.7
- 46 – 55 years old	51	34.0
- 56 – 65 years old	52	34.7
- > 65 years old	15	10.0
Sex		
- Female	106	70.7
- Male	44	29.3
Education		
- No Study	2	1.3
- Elementary School	38	25.3
- Junior High School	18	12.0
- Senior High School	51	34.0
- College	41	27.3
Occupation		
- Unemployed	21	14.0
- Housewife	54	36.0
- Self-employed	29	19.3
- Private Employee	6	4.0
- Civil Servant	32	21.3
- Other	8	5.3
Disease History		
- Hypertension	60	40.0
- Diabetes Mellitus	16	10.7
- Hypertension and Diabetes Mellitus	19	12.7
- Hypercholesterol	5	3.3
- Coronary Heart Diseases	11	7.3
- Hypertension, Diabetes Mellitus, Hypercholesterol	9	6.0
- Others	7	4.7
- None	23	15.3
Body Mass Index		
- Normal	97	64.7
- Overweight	26	17.3
- Obesity	27	18.0
Current Symptoms		
- Chest Pain	15	10.0
- Headache / neck pain	45	30.0
- Asthma	6	4.0
- Frequent urination / tingling	14	9.3
- Others symptom	8	5.3
- None	62	41.3
Symptoms Felt During a Disaster		
- Chest Pain	8	5.3
- Headache / neck pain	52	34.7
- Asthma	6	4.0
- Frequent urination / tingling	13	8.7
- Others symptom	6	4.0
- None	65	43.3
Last Health Checkup		
- 1 month ago	116	77.3
- 3 months ago	17	11.3
- 6 months ago	2	1.3
- 1 year ago	15	10.0

Table 2. Bivariate Analysis of the Relationship of Cardiovascular Emergency Prevention Factors with Physical Vulnerability

Physical Vulnerability		Low		High		p-value	OR	CI 95%	
		n	%	n	%			Lower	Upper
Community Capacity	Good	122	91.0	12	9.0	<0.001	10.20	3.314	31.395
	Not good	7	43.8	9	56.2				
Experience Prevention	Good	120	88.2	16	11.8	<0.001	10.00	3.073	32.546
	Not good	6	42.9	8	57.1				
Family Support	Good	120	88.2	16	11.8	<0.001	10.00	3.073	32.546
	Not good	6	42.9	8	57.1				
Healthcare Support	Good	125	87.4	18	12.6	<0.001	41.67	4.739	366.355
	Not good	1	14.3	6	85.7				
Availability of Health Facilities	Good	111	91.0	11	9.0	<0.001	8.74	3.325	23.005
	Not good	15	53.6	13	46.4				
Availability of Referral Services	Good	114	90.5	12	9.5	<0.001	9.50	3.505	25.747
	Not good	12	50.0	12	50.0				
Policy Availability	Yes	111	91.0	11	9.0	<0.001	8.74	3.325	23.005
	No	15	53.6	13	46.4				
Policy Implementation	Good	114	89.8	13	10.2	<0.001	8.04	2.959	21.835
	Not good	12	52.2	11	47.8				
Economy Status	Good	96	96.0	4	4.0	<0.001	16.00	5.071	50.487
	Not good	30	60.0	20	40.0				
Health Insurance Availability	Good	96	96.0	4	4.0	<0.001	16.00	5.071	50.487
	Not good	30	60.0	20	40.0				
Distance to Health Facilities	Near	113	88.3	15	11.7	0.002	5.21	1.907	14.265
	Far	13	59.1	9	40.9				

employed reflects the local economic structure that depends on the informal sector.

Based on the health status of the respondents, hypertension was the most dominant disease. Overall, more than half of respondents (84.7%) had at least one major cardiovascular risk factor (hypertension, DM, hypercholesterolemia, or coronary heart diseases, indicating a very high burden of non-communicable diseases. According to the Body Mass Index (BMI), more than half of the respondents had a normal BMI. The rest are overweight and obese. The combination of hypertension and obesity increases the risk of metabolic syndrome and cardiovascular emergencies such as stroke or acute myocardial infarction. When data was collected, the symptoms that the respondents were feeling in the form of headache/neck pain were the most frequently reported symptoms, which was 30.0% (n=45). A total of 41.3% (n=62) of respondents stated that they do not feel any symptoms at this time, but this does not guarantee a safe cardiovascular condition because many heart diseases are asymptomatic. Meanwhile, during a disaster event, headache/neck pain increased to 34.7% (n=52), indicating physiological stress due to psychological and environmental stress. Meanwhile, as many as 43.3% (n=65) of respondents did not feel symptoms during the disaster, which could reflect coping mechanisms or lack of awareness of cardiovascular symptoms. A total of 77.3% (n=116) of respondents have had health check-ups in the past 1 month, which indicates that there are routine health monitoring efforts.

Based on table 2, the results of the bivariate analysis show that all variables are meaningfully related to physical vulnerability in people living in disaster-prone areas. Community capacity, experience, family support, health worker support, availability of tools and facilities, referral services, availability and implementation of policies, economic status, health insurance ownership, and distance of health facilities all had p<0.05 values.

Table 3. Results of Bivariate Analysis of the Relationship of Cardiovascular Emergency Prevention Factors with Psychological Vulnerability

Psychological Vulnerability		Low		High		p-value	OR	CI 95%	
		n	%	n	%			Lower	Upper
Community Capacity	Good	27	20.1	107	79.9	0.744	0.76	0.226	2.533
	Not good	4	25.0	12	75.0				
Experience Prevention	Good	25	18.4	111	81.6	0.042	0.30	0.096	0.943
	Not good	6	42.9	8	57.1				
Family Support	Good	24	17.6	112	82.4	0.010	0.21	0.069	0.668
	Not good	7	50.0	7	50.0				
Healthcare Support	Good	28	19.6	115	80.4	0.155	0.32	0.069	1.534
	Not good	3	42.9	4	57.1				
Availability of Health Facilities	Good	23	18.9	99	81.1	0.301	0.58	0.228	1.482
	Not good	8	28.6	20	71.4				
Availability of Referral Services	Good	21	16.7	105	83.3	0.011	0.28	0.110	0.715
	Not good	10	41.7	14	58.3				
Policy Availability	Yes	20	16.4	102	83.6	0.017	0.30	0.124	0.743
	No	11	39.3	17	60.7				
Policy Implementation	Good	24	18.9	103	81.1	0.261	0.53	0.197	1.438
	Not good	7	30.4	16	69.6				
Economy Status	Good	14	14.0	86	86.0	0.006	0.32	0.140	0.713
	Not good	17	34.0	33	66.0				
Health Insurance Availability	Good	14	14.0	86	86.0	0.006	0.32	0.140	0.713
	Not good	17	34.0	33	66.0				
Distance to Health Facilities	Near	24	18.8	104	81.2	0.165	0.49	0.182	1.345
	Far	7	31.8	15	68.2				

Table 4. Bivariate Analysis of the Relationship between Cardiovascular Emergency Prevention Factors and Social Vulnerability

Social Vulnerability		Low		High		p-value	OR	CI 95%	
		n	%	n	%			Lower	Upper
Community Capacity	Good	122	91.0	12	9.0	<0.001	13.07	4.130	41.367
	Not good	7	43.8	9	56.2				
Experience Prevention	Good	122	89.7	14	10.3	0.001	8.71	2.665	28.492
	Not good	7	50.0	5	50.0				
Family Support	Good	125	91.9	11	8.1	<0.001	28.41	7.641	105.625
	Not good	4	28.6	10	71.4				
Healthcare Support	Good	127	88.8	16	11.2	<0.001	19.84	3.552	110.849
	Not good	2	28.6	5	71.4				
Availability of Health Facilities	Good	113	92.6	9	7.4	<0.001	9.42	3.428	25.866
	Not good	16	57.1	12	42.9				
Availability of Referral Services	Good	117	92.9	9	7.1	<0.001	13.00	4.555	37.104
	Not good	12	50.0	12	50.0				
Policy Availability	Yes	112	91.8	10	8.2	<0.001	7.25	2.675	19.637
	No	17	60.7	11	39.3				
Policy Implementation	Good	116	91.3	11	8.7	<0.001	8.11	2.894	22.734
	Not good	13	56.5	10	53.5				
Economy Status	Good	98	98.0	2	2.0	<0.001	30.03	6.621	136.215
	Not good	31	62.0	19	38.0				
Health Insurance Availability	Good	98	98.0	2	2.0	<0.001	30.03	6.621	136.215
	Not good	31	62.0	19	38.0				
Distance to Health Facilities	Near	115	89.8	13	10.2	<0.004	5.05	1.785	14.314
	Far	14	63.6	8	36.4				

Among these variables, health worker support had the most dominant influence, with an odds ratio (OR) of 41.67 (95% CI: 4.74–366.35), indicating that individuals with less health worker support were 41 times more at risk of experiencing physical vulnerability. Economic status and health insurance availability also had a large effect (OR=16.00), followed by community capacity, experience, family support, and availability of referral services. These findings confirm that aspects of health service support, including health worker support, the availability of health insurance, and economic status, are the main components in reducing physical vulnerability to cardiovascular emergencies in people living in disaster-prone areas.

Based on table 3 related to psychological vulnerability, not all factors show a meaningful relationship. Significant factors were experience (OR=0.30; p=0.042), family support (OR=0.21; p=0.010), availability of referral services (OR=0.28; p=0.011), policy availability (OR=0.30; p=0.017), and economic status and health insurance ownership (both OR=0.32; p=0.006). Respondents with good experience in emergency prevention were 70% less likely to experience high psychological vulnerability than those with less experience. Respondents with good family support had a 79% lower chance of experiencing high psychological vulnerability compared to those with poor family support. The availability of good referral services lowers the chances of high psychological vulnerability by 72% compared to inadequate referral services. The existence of supportive policies is related to a 70% reduction in the chance of high psychological vulnerability compared to the absence of policies. Respondents with good economic status had a 68% lower chance of experiencing high psychological vulnerability compared to low economic status. Respondents who had health insurance had a 68% lower chance of experiencing high psychological vulnerability compared to those who did not have insurance. All of these factors play a protective role, which means individuals with experience, family support, available policies, as well as better economic status conditions and availability of health insurance tend to have lower psychological vulnerability. Conversely, community capacity, support for health workers, availability of health equipment and facilities, policy implementation, and proximity to health facilities do not show a meaningful relationship. This indicates that the factors of experience, the provision of family support, the existence of policies, referral services and health insurance, and the economic status of the

Table 5. Results of Multivariate Analysis of Logistic Regression Effect of Cardiovascular Emergency Prevention with Physical Vulnerability, Psychological Vulnerability and Social Vulnerability

	p-value	OR	CI 95%	
			Lower	Upper
A. Physical Vulnerability				
Health Worker Support	0.011	0.042	.004	.476
Economy Status	0.000	0.075	.023	.250
Constant	0.045	11.761		
B. Psychological Vulnerability				
Familiy Support	0.087	2.913	.857	9.902
Economy Status	0.045	2.459	1.022	5.917
Constant	0.820	0.884		
C. Social Vulnerability				
Family Support	0.001	0.080	.018	.352
Economy Status	0.000	0.052	.011	.250
Constant	0.039	4.099		

community are more dominant in determining psychological resilience for the prevention of cardiovascular emergencies in people living in disaster-prone areas.

Table 4 illustrates the results of the social vulnerability analysis showing that all variables have a meaningful relationship. Economic status and health insurance ownership occupied the largest influence with OR=30.03 (p<0.001), followed by family support (OR=28.41; p<0.001) and health worker support (OR=19.84; p<0.001). Other factors such as community capacity, experience, availability of health equipment and facilities, referral services, availability and implementation of policies are also significantly related. The distance between health facilities, although significant, showed a relatively smaller effect (OR=5.05). Respondents with poor community capacity were 13 times more likely to experience high social vulnerability compared to good communities. Respondents with less prevention experience had 8.7 times more likely to experience high social vulnerability compared to those with a good experience. Respondents with less family support were 28 times more likely to experience high social vulnerability compared to those with good family support. Lack of support for health workers increases the chances of social vulnerability by 19.8 times compared to good support. Limited health facilities increase the chance of social vulnerability by 9.4 times compared to adequate facilities. The unavailability of referral services increases the chances of social vulnerability by 13 times compared to available services. The absence of a policy increases the chance of social vulnerability by 7.25 times compared to the existence of a policy. Poor policy implementation increases the chances of social vulnerability by 8.1 times compared to good implementation. Respondents with low economic status were 30 times more likely to experience high social vulnerability compared to those with good economies. Respondents without health insurance were 30 times more likely to experience high social vulnerability compared to those with insurance. Respondents who live far from health facilities are 5 times more likely to experience high social vulnerability compared to those who live nearby. Overall, these results confirm that the socio-economic dimension, especially family support and economic status conditions, are determinants of community social vulnerability in preventing cardiovascular emergencies in people living in disaster-prone areas.

Table 5 illustrates the results of the multivariate logistic regression analysis, showing that not all significant factors in the bivariate analysis persisted after being controlled together. In physical vulnerability, the dominant factors were health worker support (OR=0.042; p=0.011) and economic status (OR=0.075; p<0.001), which showed that health worker support and good economic status were able to reduce the odds of physical vulnerability by 95.8% and 92.5%, respectively. Regarding psychological vulnerability, economic status remained significant (OR=2.459; p=0.045), indicating that a low economic status increased the risk of psychological vulnerability by 2.5 times, while family support was only close to being significant. In social vulnerability, the two dominant factors were family support (OR=0.080; p=0.001) and economic status (OR=0.052; p<0.001), each of which reduced the risk of social vulnerability by more than 90%. This shows that the economic status and social support of families and health workers are the most important determinants in the three dimensions of vulnerability for the prevention of cardiovascular emergencies in people living in disaster-prone areas.

Discussions

The results of this study provide a comprehensive overview of the factors related to susceptibility to cardiovascular emergencies in adult populations living in disaster-prone areas. The key findings suggest that although many variables showed a significant relationship in the bivariate analysis, only a few factors remained statistically dominant predictors after controlling for in the multivariate model, namely health worker support, family support, and economic status.

Respondent Characteristics and Implications for Cardiovascular Vulnerability

The majority of respondents were in the productive age range to early elderly (36–65 years), which is an age group with a high risk of cardiovascular disease (CHD). The higher proportion of women reflects local demographics but is also relevant because women have an increased risk of CHD with age (Cader, Sareen and Press, 2025) In addition. Hypertension is the dominant risk factor, followed by overweight/obesity, which is a component of metabolic syndrome and a major contributor to the burden of cardiovascular disease. Hypertension is one of the three main risk factors associated with cardiovascular death (Kiew *et al.*, 2024).

Although most respondents had health checks in the past month, indicating access to or awareness of health services, the majority had low to intermediate education levels. This can limit health literacy; therefore, even if they are checked regularly, their understanding of the early symptoms of a heart emergency, such as atypical chest pain or shortness of breath, may still be limited. Therefore, a health education program is expected to be implemented to increase health literacy in the community (Kahar *et al.*, 2025; Ly *et al.*, 2025) This phenomenon is supported by the finding that 41.3% of respondents did not feel symptoms at the time of data collection, whereas more than two-thirds (67.7%) had at least one major risk factor. This underscores the

importance of early detection and contextual health education, especially in disaster-prone areas that are vulnerable to disruption of health care systems. Early detection through physical examination is one of the methods used to determine the presence of abnormalities. By knowing it earlier, intervention will be carried out earlier to prevent attacks (Dekker-Klaassen *et al.*, 2025) especially in people who live in disaster-prone areas. Natural disaster conditions can affect access to health services (Chang and Meyerhoefer, 2025)

During a disaster event, the prevalence of headache/neck pain increased from 30.0% to 34.7%, which may reflect the presence of physiological stress due to the psychological stress. Studies have shown that natural disaster conditions can provide traumatic experiences to victims, thus increasing the presence of mental health disorders in a person (Flinn *et al.*, 2025). However, 43.3% of respondents reported not feeling symptoms during a disaster, which could be caused by adaptive coping mechanisms. Adaptive coping involves using cognitive and emotional abilities to increase a person's resilience in managing stress (Akdag Topal *et al.*, 2025) In the context of disasters, the physiological response to chronic stress can quietly worsen cardiovascular conditions; therefore, it is important to develop active screening and early warning systems for at-risk individuals.

Factors related to Physical Vulnerability

Bivariate analysis showed that all independent variables, ranging from community capacity to proximity to health facilities, were significantly related to physical vulnerability. However, in the multivariate analysis, only health worker support and economic status remained the main predictors. Good health worker support is related to a reduced risk of physical vulnerability. These findings are very strong and support the literature suggesting that regular interactions with healthcare workers, lifestyle counseling, and medication and blood pressure monitoring effectively reduce risky behaviors and improve adherence to medication (Afik *et al.*, 2023; Fikriana and Afik, 2023; Sharif *et al.*, 2025; Sirimalla *et al.*, 2025) In disaster areas, the presence of health workers trained in chronic disease management is crucial, especially when infrastructure is disrupted. Routine medical care for people with chronic diseases can be disrupted by natural disasters (e.g., earthquakes, floods, and landslides), which can result in chronic health conditions becoming acute (Kearns, Blake and Parton, 2024)

Good economic status also showed a huge protective effect, meaning that individuals with low economic status had more than 13 times the risk of physical vulnerability compared to those with good economic status. This reflects the inequality of access to healthy nutrition, medicines, transportation for health control, and the ability to avoid strenuous physical work that can worsen heart conditions. These results are consistent with global studies showing that poverty is a major social determinant of cardiovascular morbidity (Butt *et al.*, 2024; The Lancet Regional Health – Americas, 2025).

Factors Related to Psychological Vulnerability

Psychological vulnerability, which includes symptoms of anxiety and stress, is affected by different factors than those affecting physical vulnerability. In the bivariate analysis, previous disaster experience, family support, availability of referral services, policies, and economic status showed significant relationships. However, in the multivariate model, only economic status remained significant, while family support was close to significance.

These findings show that economic conditions are related to the physical aspect and have a profound impact on mental health. Individuals with low economic status are more susceptible to chronic stress due to life uncertainty, lack of savings, and the burden of health costs, which can exacerbate heart health-related anxiety, especially when faced with the threat of a disaster. Studies have also found that perceptions of financial inadequacy related to heart care are closely correlated with symptoms of depression and anxiety (Bjørndal *et al.*, 2025).

Family support, although not statistically significant in the final model, showed a strong directional effect, indicating great potential for psychological protection. This is in line with studies showing that the availability of social support from the family is an important component that can affect a person's psychological state (Sari and Duman, 2022; Kim *et al.*, 2025). In a collectivist culture such as Indonesia, family is often the main source of emotional and practical support. However, in disaster situations, the family's function as a safety net can be disrupted if all members experience trauma or loss. Therefore, psychosocial interventions involving families should be considered to strengthen mental resilience. Factors such as community capacity and access to health facilities do not significantly affect psychological vulnerability, suggesting that psychological aspects are more influenced by interpersonal dynamics and economic stability than by service infrastructure (Blackman *et al.*, 2023; Heanoy and Brown, 2024).

Factors Related to Social Vulnerability

Social vulnerability, which describes an individual's perception of social support from family, friends, and health workers, is strongly influenced by two main factors: the availability of family support and economic status. In the multivariate analysis, good family support reduced the risk of social vulnerability by 92%, whereas good economic status reduced the risk by 94.8%. These outcomes are particularly appropriate because individuals who feel emotionally and financially supported are more likely to have confidence, social

engagement, and the ability to seek help when necessary. These findings are in line with the theory that social support serves as a *buffer* against stress, especially in crisis situations (Sabado-Liwag *et al.*, 2025; Tenaw, Ngai and Lam, 2025). In disaster areas, a strong social network can facilitate evacuation, access to information, and distribution of medical assistance, all of which are important for individuals with chronic illness.

Other factors, such as the availability of policies and referral services, although significant in bivariate analyses, were not included in the final model, likely because the effects were absorbed by economic status variables and family support. This shows that formal policies alone are not enough without inclusive implementation and support from the immediate environment (Cometto *et al.*, 2018). The practical Implications of this research suggest the need to strengthen the role of community health workers through cardiovascular emergency prevention and disaster preparedness management training for the prevention of cardiovascular emergencies. In such conditions, the existence of health workers is a very important component of social *support* for the prevention of an increase in cardiovascular cases (Afik and Fikriana, 2021; Fikriana, 2021). Provide family support programs through education on early detection of heart symptoms and stress management, as well as the provision of health insurance and social assistance to mitigate the impact of low economic status on cardiovascular health. In addition, disaster risk-based health policies that prioritize vulnerable populations with chronic diseases, especially those that have the potential to increase the risk of cardiovascular emergencies, should be developed.

This study had several limitations. First, the use of a cross-sectional design does not allow the study results to measure the exact cause and effect between the dependent and independent variables. The use of a cross-sectional design limits the ability to establish causal relationships between cardiovascular emergency prevention factors and the vulnerability outcomes. The observed associations reflect correlations at a single point in time and may be influenced by unmeasured confounding variables. Second, the sampling strategy employed in this study may limit the generalizability of our findings. Participants were recruited from selected primary healthcare centers, which may not fully represent the broader population of individuals at risk for cardiovascular disease. Additionally, the use of non-probability sampling (if applicable) or facility-based sampling could introduce selection bias, as individuals who access healthcare services may differ systematically from those who do not, particularly in terms of health awareness, socioeconomic status, and healthcare access. Third, reliance on self-reported data may introduce information bias, including recall and social desirability biases. Participants may have overreported positive behaviors (e.g., preventive practices) or underreported vulnerabilities, potentially affecting the accuracy of the measured associations.

Conclusion

This study stated that economic status and support variables showed the most consistent associations with vulnerability outcomes in this study sample. Good economic status and support from families and health workers were significantly related to reduced physical, psychological, and social vulnerability. Strengthening family involvement and improving healthcare system readiness, especially health worker support, are essential strategies for reducing vulnerability to cardiovascular emergencies. The findings of this study have important implications for both clinical practice and health policy, particularly in strengthening cardiovascular emergency prevention at the primary health care level. Health interventions in disaster areas must integrate a multidimensional approach that not only focuses on the medical aspect but also strengthens the social and economic resilience of at-risk communities.

Acknowledgments

The authors would like to thank the Taliwang Health Care Center, West Sumbawa, Indonesia, for assisting with the data collection process. The research data are available upon reasonable request from the corresponding author.

Decleration Of Generative Artificial Intelligence (AI) Use

The article was written independently by the author. The author states did not use any artificial intelligence tools.

Funding source

This research was funded by the Ministry of Higher Education, Science, and Technology Republic Indonesia (No: 128/C3/DT.05.00/PL/2025).

Availability of data and materials

Other researchers can contact the corresponding author if they need clarification of study results, replicate experiments, or build upon the research

Authors' contributions

R.F.: Make a proposal, collect data, make a research report, and manuscript writing.; D.K.: assist in data retrieval, collect data and data analysis.; A.A.: provide data input, make a comparative analysis with a literature review for completeness of the discussion.

Declaration of Interest

There is no conflict of interest in this research.

References

Afik, A. *et al.* (2023) "Overcoming relapse experience in acute coronary syndrome patients," *Bali Medical Journal*, 12(1), pp. 510–513. doi: 10.15562/bmj.v12i1.3738.

Afik, A. and Fikriana, R. (2021) "Self-care Experience in Hypertensive Patients," *Balimedicaljournal.Org*, 10(3), pp. 1398–1402. doi: 10.15562/bmj.v10i3.2982.

Akdag Topal, C. *et al.* (2025) "Psychometric Properties of the Turkish Adaptive Coping with Disease Scale in Adult Cancer Patients," *Seminars in Oncology Nursing*, 41(3), p. 151847. doi: https://doi.org/10.1016/j.soncn.2025.151847.

Aksa, F. I., Ashar, M. and Siswanto, H. W. (2024) "Knowledge, attitude, and practices of tsunami-prone communities, Nias, Indonesia.," *Jamba (Potchefstroom, South Africa)*, 16(1), p. 1639. doi: 10.4102/jamba.v16i1.1639.

Babaie, J. *et al.* (2021) "Cardiovascular Diseases in Natural Disasters; a Systematic Review.," *Archives of academic emergency medicine*, 9(1), p. e36. doi: 10.22037/aaem.v9i1.1208.

Bjørndal, L. D. *et al.* (2025) "Financial factors and depression and anxiety: A symptom-specific approach in the general population," *SSM - Mental Health*, 8, p. 100508. doi: https://doi.org/10.1016/j.ssmmh.2025.100508.

Blackman, D. *et al.* (2023) "Wellbeing in disaster recovery: Understanding where systems get stuck," *International Journal of Disaster Risk Reduction*, 95, p. 103839. doi: https://doi.org/10.1016/j.ijdrr.2023.103839.

BNPB (2024) "Sebaran Kejadian Bencana Alam 2024."

Butt, S. A. *et al.* (2024) "Multidimensional Poverty and Risk of Atherosclerotic Cardiovascular Disease: A U.S. National Study," *JACC: Advances*, 3(7, Part 2), p. 100928. doi: https://doi.org/10.1016/j.jacadv.2024.100928.

Cader, F. A., Sareen, N. and Press, M. C. (2025) "Acute Coronary Syndrome in Women," *Interventional Cardiology Clinics*, 14(1), pp. 9–19. doi: https://doi.org/10.1016/j.iccl.2024.08.011.

Chang, H.-H. and Meyerhoefer, C. D. (2025) "How natural disaster shocks to agriculture affect health care use and expenditure," *World Development*, 195, p. 107122. doi: https://doi.org/10.1016/j.worlddev.2025.107122.

Chang, J., Villeneuve, M. and Morris, A. (2020) "Emergency Preparedness Survey of People with Disability," (August).

Cometto, G. *et al.* (2018) "Health policy and system support to optimise community health worker programmes: an abridged WHO guideline," *The Lancet Global Health*, 6(12), pp. e1397–e1404. doi: https://doi.org/10.1016/S2214-109X(18)30482-0.

Dekker-Klaassen, A. *et al.* (2025) "Perspectives of health care professionals on the value of physical examinations for early detection of breast cancer recurrences: More than just a detection method?," *Measurement and Evaluations in Cancer Care*, 3, p. 100016. doi: https://doi.org/10.1016/j.ymecc.2025.100016.

Fatema, S. R. (2020) "Women ' s health- - related vulnerabilities affected areas of in natural disaster- - Bangladesh : a mixed- - methods study protocol," pp. 1–6. doi: 10.1136/bmjopen-2020-039772.

Fikriana, R. (2021) "Family and Health Workers Support Influence Self-Regulation Based on Spirituality in Hypertension Patient," *Indian Journal of Forensic Medicine & Toxicology*, 15(3), pp. 4068–4073. doi: 10.37506/ijfmt.v15i3.15931.

Fikriana, R. and Afik, A. (2023) "Outcome Expectancies And Planning in Acute Coronary Syndrome Patients," *The Southeast Asian Journal of Tropical Medicine and Public Health*, 54(16), pp. 35–46.

Fikriana, R., Afik, A. and Aditya, R. S. (2025) "Spirituality and self-management in coronary heart diseases patient," 14(1), pp. 343–350. doi: 10.11591/ijphs.v14i1.24671.

Flinn, M. V *et al.* (2025) "Cortisol and psychological responses to natural disasters," *Psychoneuroendocrinology*, 177, p. 107474. doi: https://doi.org/10.1016/j.psyneuen.2025.107474.

Haksama, S. *et al.* (2025) "Health Disaster Capacity and Preparedness in the Case of Tsunami and Earthquake Disaster Faculty of Health , Medicine and Natural Sciences , Universitas Airlangga , Banyuwangi , Faculty of Medicine , Universitas Surabaya , Indonesia." doi: 10.21522/TIJPH.2013.13.01.Art091.

Hayman, K. G. *et al.* (2015) "Burden of cardiovascular morbidity and mortality following humanitarian emergencies: a systematic literature review," *Prehospital and disaster medicine*, 30(1), pp. 80–88. doi: 10.1017/s1049023x14001356.

Heanoy, E. Z. and Brown, N. R. (2024) "Impact of Natural Disasters on Mental Health: Evidence and Implications.," *Healthcare (Basel, Switzerland)*, 12(18). doi: 10.3390/healthcare12181812.

Indonesian Ministry of Health (2021) "Erupsi Gunung Semeru Kabupaten Lumajang."

Jaramillo, S. *et al.* (2019) "Early Screening for Posttraumatic Stress Disorder and Depression Among Injured Emergency Department Patients: A Feasibility Study.," *Academic emergency medicine : official journal of the Society for Academic Emergency Medicine*, 26(11), pp. 1232–1244. doi: 10.1111/acem.13816.

Kahar, P. *et al.* (2025) "A community-based health education program: effects and differences in health literacy and self-efficacy across demographic and health variables among Haitians," *Health Education*, 125(4), pp. 448–461. doi: https://doi.org/10.1108/HE-01-2024-0003.

Kearns, N., Blake, D. and Parton, C. (2024) "Get ready: disaster preparedness and response for people with chronic illnesses living in hazard-prone Petone, Aotearoa New Zealand," *Disaster Prevention and Management: An International Journal*, 34(2), pp. 195–209. doi: https://doi.org/10.1108/DPM-04-2024-0105.

Kiew, X. K. *et al.* (2024) "Predicting mortality risk among ACS patients with hypertension comorbidity in Malaysia by using ensemble learning technique," *International Journal of Cardiology*, 417, p. 132848. doi: https://doi.org/10.1016/j.ijcard.2024.132848.

Kim, D. H., Kim, D. and Kang, H. (2025) "A scoping review of health risks and outcomes from disasters in the Republic of Korea," *BMC Public Health*, 25(1), p. 1369. doi: 10.1186/s12889-025-22362-7.

Kim, S. *et al.* (2025) "Mediating Effects of Psychological Independence and Social Support on the Association Between Family Strength and Depression in Young Korean Adults: Cross-Sectional Study," *JMIR Formative Research*, 9. doi: https://doi.org/10.2196/71485.

Knack, S. K. S. *et al.* (2024) "Early Physician Gestalt Versus Usual Screening Tools for the Prediction of Sepsis in Critically Ill Emergency Patients," *Annals of Emergency Medicine*, 84(3), pp. 246–258. doi: https://doi.org/10.1016/j.annemergmed.2024.02.009.

Kourtit, K., Nijkamp, P. and Banica, A. (2023) "An analysis of natural disasters' effects – A global comparative study of 'Blessing in Disguise,'" *Socio-Economic Planning Sciences*, 88(February), p. 101599. doi: 10.1016/j.seps.2023.101599.

Krigolson, O. E. *et al.* (2017) "Choosing MUSE: Validation of a low-cost, portable EEG system for ERP research," *Frontiers in Neuroscience*, 11(MAR), pp. 1–10. doi: 10.3389/fnins.2017.00109.

Laksmi, I. A. A., Susila, I. M. D. P. and Suprapta, M. A. (2023) "Preparedness of Emergency Room Nurses After Emerging Infectious Diseases Screening," *Jurnal Info Kesehatan*, 21(1), pp. 158–165. doi: 10.31965/infokes.vol21.iss1.892.

Li, N. *et al.* (2017) "Long-term effects of earthquake experience of young persons on cardiovascular disease risk factors.," *Archives of medical science : AMS*, 13(1), pp. 75–81. doi: 10.5114/aoms.2017.64716.

Lim, W. M. (2025) "What Is Quantitative Research ? An Overview and Guidelines." doi: 10.1177/14413582241264622.

Lúcia, V. *et al.* (2025) "Health vulnerability questionnaire in heart failure ," pp. 1–10.

Ly, J. *et al.* (2025) "A culturally-specific education strategy to improve stroke health literacy in Vietnamese communities in South Western Sydney," *Dialogues in Health*, 6, p. 100211. doi: https://doi.org/10.1016/j.dialog.2025.100211.

Narita, K., Hoshide, S. and Kario, K. (2021) "Time course of disaster-related cardiovascular disease and blood pressure elevation," *Hypertension Research*, pp. 1534–1539. doi: 10.1038/s41440-021-00698-y.

O'Connor, D. B., Thayer, J. F. and Vedhara, K. (2021) "Stress and Health: A Review of Psychobiological Processes," *Annual Review of Psychology*, 72, pp. 663–688. doi: 10.1146/annurev-psych-062520-122331.

Ramdani, F., Setiani, P. and Setiawati, D. A. (2019) "Analysis of sequence earthquake of Lombok Island, Indonesia," *Progress in Disaster Science*, 4, p. 100046. doi: 10.1016/j.pdisas.2019.100046.

Ribeiro, V. *et al.* (2021) "Health vulnerability assessment questionnaire for people with heart failure : construction and validation," *Rev. Eletr. Enferm.*, 23, pp. 1–11.

Sabado-Liwag, M. D. *et al.* (2025) "Mental health self-stigma moderates the effect of social support on depression, anxiety and stress among young adult Pacific Islanders," *SSM - Mental Health*, 8, p. 100471. doi: https://doi.org/10.1016/j.ssmmh.2025.100471.

Sari, A. and Duman, Z. Ç. (2022) "Effects of the family support and psychoeducation program based on the Calgary Family Intervention Model on the coping, psychological distress and psychological resilience levels of the family caregivers of chronic psychiatric patients.," *Archives of psychiatric nursing*, 41, pp. 1–10. doi: 10.1016/j.apnu.2022.07.014.

Sharif, N. V. *et al.* (2025) "Improved medication adherence and health literacy in parents of children with ADHD: Effects of a targeted educational program," *Exploratory Research in Clinical and Social Pharmacy*, 19, p. 100634. doi: https://doi.org/10.1016/j.rcsop.2025.100634.

Sirimalla, S. *et al.* (2025) "Impact of medication therapy management on medication adherence and health-related quality of life among non-dialysis chronic kidney disease patients," *Research in Social and Administrative Pharmacy*. doi: https://doi.org/10.1016/j.sapharm.2025.08.002.

Tenaw, L. A., Ngai, F. W. and Lam, K. W. K. (2025) "The role of sense of coherence, self-efficacy, social support and perceived stress on postpartum depression during the transition to motherhood: A path analysis," *Applied Nursing Research*, 85, p. 151998. doi: https://doi.org/10.1016/j.apnr.2025.151998.

The Lancet Regional Health – Americas (2025) "Cardiovascular disease: addressing poverty is key," *The Lancet Regional Health - Americas*, 42, p. 101029. doi: https://doi.org/10.1016/j.lana.2025.101029.

Tjitrawati, A. T. and Romadhona, M. K. (2023) "Affliction in the post Palu disaster: State failure to implement human rights standard on disaster management," *Cogent Social Sciences*, 9(1). doi: 10.1080/23311886.2023.2233255.

Wahidin, M. *et al.* (2022) "Health System Disruption at the Primary Health Center Level Affected by Earthquake, Tsunami, and Liquefaction in 3 Districts of Central Sulawesi, Indonesia.," *Disaster medicine and public health preparedness*, 17, p. e95. doi: 10.1017/dmp.2021.368.

Yamaoka-Tojo, M. and Tojo, T. (2024) "Prevention of Natural Disaster-Induced Cardiovascular Diseases," *Journal of Clinical Medicine*, 13(4), pp. 1–9. doi: 10.3390/jcm13041004.

Yiang, G.-T. *et al.* (2021) "Early Screening of Risk for Multidrug-Resistant Organisms in the Emergency Department in Patients With Pneumonia and Early Septic Shock: Single-Center, Retrospective Cohort Study.," *Shock (Augusta, Ga.)*, 55(2), pp. 198–209. doi: 10.1097/SHK.0000000000001599.

How to cite this article: Fikriana, R., Kurniawan, D., and Afik, A. (2026) 'Predictors of physical, psychological, and social vulnerability of cardiovascular emergencies prevention in disaster-prone communities: a cross-sectional study', *Jurnal Ners*, 21(2), pp. 139-149. doi: http://dx.doi.org/10.20473/jn.v21i2.79911