

Health and Nutrition Assistance for Vulnerable Groups in Communities Affected by Natural Disasters

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ABSTRACT

Natural disasters create serious health and nutritional challenges, particularly for vulnerable groups such as toddlers, children, pregnant and breastfeeding women, older adults, and people with disabilities. Limited access to healthcare, nutritious food, and health information often worsens their condition. This community service program aimed to improve access to basic health services, enhance nutritional support, and increase health and nutrition knowledge among vulnerable groups affected by natural disasters in Batipuh District, Tanah Datar Regency. A Participatory Action Research (PAR) approach was implemented involving 65 participants selected through purposive sampling. Program activities included basic health screening, nutritional assistance, health and nutrition education, and evaluation using pre- and post-tests. Data were analyzed descriptively using frequencies, percentages, and knowledge score comparisons. All participants received health services and nutritional support. Health screening identified hypertension (27.7%), acute respiratory infections (12.3%), digestive disorders (9.2%), and skin diseases (6.2%). Nutritional assessment showed that 60.0% had good nutritional status, while 27.7% were at risk of malnutrition and 12.3% were undernourished. The educational intervention increased average knowledge scores from 61.38 to 84.77, representing a 38.1% improvement. Overall, the PAR-based program effectively improved healthcare access, nutritional support, and community knowledge while strengthening community capacity and promoting sustainable, community-based health and nutrition resilience in post-disaster settings.

Keywords: Health Assistance, Nutrition Assistance, Vulnerable Groups, Natural Disasters, Participatory Action Research

INTRODUCTION

Indonesia is one of the countries with the highest level of natural disaster risk in the world because it is located at the confluence of three major tectonic plates: the Eurasian, Indo-Australian, and Pacific. This geographical condition makes Indonesia vulnerable to various types of natural disasters such as earthquakes, tsunamis, volcanic eruptions, floods, landslides, and extreme weather that occur almost every year. In addition to causing infrastructure damage and significant economic losses, natural disasters also have a direct impact on public health. The World Health Organization (WHO) emphasizes that emergency situations due to disasters often disrupt health care systems, increase the risk of infectious diseases, and reduce public access to basic health services (WHO, 2024). These conditions indicate that the health sector is one of the sectors most affected in disaster situations and requires special attention in the post-disaster management and recovery process (World Health Organization, 2024).

The health impacts that emerge after a disaster are not only related to physical injuries caused by the event but also encompass a range of broader public health issues. Damage to health facilities, limited medical personnel, disruption to drug distribution, and declining environmental sanitation are often major issues during emergency response. The WHO stated that various disasters in Indonesia during 2024 demonstrated the need to strengthen the health response system to reduce the risk of disease and death in affected communities (WHO, 2024). This situation is further complicated when people are forced to live in refugee camps with inadequate environmental conditions, limited clean water, and unstable access to food. Therefore, post-disaster health management efforts must be carried out quickly, planned, and sustainably.

In the context of disasters, not all community groups have the same capacity to cope with the impacts of disasters. Vulnerable groups such as toddlers, children, pregnant women, breastfeeding mothers, the elderly, and people with disabilities are at higher risk of experiencing health problems than the general population. This vulnerability is influenced by physiological conditions, limited mobility, special nutritional needs, and dependence on family support and health services. According to Kasaoka et al. (2021), toddlers and children are the most vulnerable to nutritional problems during the evacuation period due to limited access to age-appropriate food. This situation indicates that vulnerable groups require a more specific and targeted service approach in every disaster management program (Kasaoka et al., 2021).

Health problems in vulnerable groups post-disaster can manifest in various forms. Crowded refugee camps often increase the risk of acute respiratory infections, diarrhea, skin diseases, and other environmental-related diseases (Dewi et al., 2023). Furthermore, reproductive health problems in pregnant and breastfeeding women are also frequently encountered due to limited maternal health services. Various studies have shown that emergencies can worsen the health status of vulnerable groups if not accompanied by adequate intervention. Therefore, basic health services are a priority that must be met immediately at every stage of disaster management.

In addition to health issues, nutrition is a critical issue that frequently arises in disaster-affected communities. Disruptions in food distribution, limited availability of nutritious food, and changes in consumption patterns during the evacuation period can lead to a decline in community nutritional status. UNICEF (2022) emphasizes that natural disasters are a factor that can exacerbate malnutrition by disrupting access to food and nutrition services, particularly for children and pregnant women (UNICEF, 2022). This situation has the potential to increase the incidence of



protein-energy malnutrition, micronutrient deficiencies, and growth disorders in children. Therefore, nutrition interventions are an integral part of efforts to protect vulnerable groups during emergencies and post-disaster recovery.

Toddlers are highly sensitive to changes in food intake and environmental conditions. In disaster situations, toddlers often experience difficulty obtaining appropriate complementary foods, limited access to protein sources, and an increased risk of infectious diseases that can worsen their nutritional status. A study by Kasim et al. (2025) showed that providing ready-to-eat foods that are not appropriate for toddlers' age ranges often hinders nutritional management in evacuation centers. If this condition persists over a prolonged period, it can increase the risk of stunting, wasting, and micronutrient deficiencies, which impact children's growth and development (Kasim et al., 2025).

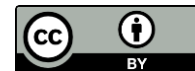
Pregnant and breastfeeding women are also groups that require special attention during disasters. The need for energy, protein, iron, folic acid, and various other micronutrients increases during pregnancy and breastfeeding. However, emergencies often limit access to nutritious food and maternal health services. UNICEF (2022) states that the quality of maternal nutrition during pregnancy plays a critical role in determining the health status of both mother and baby. Therefore, targeted nutritional assistance is crucial to prevent pregnancy complications and impaired fetal growth in disaster-affected communities (UNICEF, 2022).

The elderly also face unique challenges during the evacuation period. Decreased physiological function, pre-existing chronic illnesses, and limited mobility make them more vulnerable to health problems (Surya & Ardiansyah, 2022). In addition to requiring routine healthcare services, the elderly also require adequate nutrition to maintain their immune system and accelerate recovery. When these needs are not met, the risk of illness and death in the elderly can increase significantly. Therefore, the availability of elderly-friendly healthcare services and nutritional assistance is a crucial part of efforts to protect vulnerable groups post-disaster.

Health and nutrition assistance is a key strategy in mitigating the health impacts of disasters. Health interventions can be implemented through health checks, basic treatment, health education, disease screening, monitoring the condition of vulnerable groups, and a referral system for patients requiring further treatment (Sulistiawati & Taufiqqurrahman, 2020). Nutrition interventions, on the other hand, can be implemented through the distribution of nutritious food, provision of micronutrient supplements, monitoring nutritional status, and education on meeting nutritional needs in emergencies. Research conducted by Kasaoka et al. (2021) shows that planned nutrition assistance can help meet the needs of vulnerable groups and reduce the risk of health problems in disaster-affected communities (Kasaoka et al., 2021).

The success of health and nutrition assistance programs is greatly influenced by the involvement of various parties, including higher education institutions. In implementing the Tri Dharma of Higher Education, community service is a strategic means for universities to contribute to solving various social and humanitarian problems. Through the involvement of lecturers and students, community service activities can be realized in the form of health services, public education, assistance to vulnerable groups, and distribution of aid based on community needs. This approach not only helps communities meet their health and nutrition needs but also increases their capacity to cope with post-disaster health risks.

Collaboration between universities, local governments, healthcare workers, humanitarian organizations, and the community is crucial for the effectiveness of community service programs.



Synergy between stakeholders enables the availability of more adequate resources and expands the reach of services to vulnerable groups. Furthermore, collaboration supports program sustainability through education and community empowerment activities. Thus, health and nutrition assistance programs serve not only as a short-term response but also as part of efforts to build community resilience to future disaster risks.

Based on initial observations of disaster-affected communities, various limitations remain in meeting the health and nutritional needs of vulnerable groups. Access to basic health services is still suboptimal, while monitoring the health of toddlers, pregnant women, the elderly, and people with disabilities remains limited. Furthermore, community knowledge about achieving balanced nutrition and preventing post-disaster diseases is also relatively low. These conditions indicate that communities still need more comprehensive health and nutritional support to support the post-disaster recovery process.

Therefore, a community service program focused on providing health and nutrition assistance to vulnerable groups affected by natural disasters is needed. This program is expected to improve access to basic health services, help meet the nutritional needs of vulnerable groups, increase public knowledge about healthy lifestyles, and accelerate the process of sustainable public health recovery. Through the implementation of integrated health and nutrition assistance activities, it is hoped that the quality of life of affected communities will improve and their resilience to the impacts of future disasters will be strengthened.

METHODS

This community service activity uses a Participatory Action Research (PAR) approach, emphasizing the active involvement of the community, local government, health workers, and the community service team in every stage of the activity, from problem identification and program planning to intervention implementation and outcome evaluation. This approach was chosen because it can produce programs tailored to the needs of disaster-affected communities and encourage community empowerment in the post-disaster health and nutrition recovery process.

The activity was carried out in Batipuh District, Tanah Datar Regency, West Sumatra Province, which is one of the areas affected by natural disasters and still faces various challenges in public health recovery. The activity was carried out from January to March 2026. The target groups of the activity were vulnerable groups consisting of toddlers, children, pregnant women, breastfeeding mothers, the elderly, and people with disabilities affected by the disaster. The number of participants involved in the activity was 65 people, who were selected using a purposive sampling technique based on the criteria of disaster-affected communities and included in the category of vulnerable groups requiring health and nutrition assistance.

The program is implemented through four stages: problem identification, program planning, activity implementation, and evaluation. During the problem identification stage, the community service team conducts field observations and interviews with village officials, community leaders, health cadres, and community health center staff to obtain a picture of the community's health and nutrition status post-disaster. Furthermore, data collection on vulnerable groups is conducted to identify health needs, nutritional status, and barriers faced by the community in accessing health services during the recovery period.



The planning phase includes coordination with sub-district governments, village governments, health workers, and various related parties to develop intervention strategies tailored to community needs. During this phase, the community service team also develops health and nutrition education materials, prepares evaluation instruments in the form of observation sheets and knowledge questionnaires, and prepares health assistance and nutrition packages to be provided to participants.

The program implementation phase consists of three main activities: basic health services, nutritional assistance, and health education. Health services are provided through basic health examinations, including blood pressure, body temperature, weight, height, and mid-upper arm circumference (MUAC), identification of health complaints, and health consultations. The examinations are conducted by a team consisting of health lecturers, students, and local health workers. Participants requiring further treatment are recommended for further care at the nearest health facility.

Nutrition interventions were implemented through the provision of nutritious food packages tailored to the needs of vulnerable groups, particularly toddlers, pregnant women, breastfeeding mothers, and the elderly. In addition, simple monitoring of participants' nutritional status was conducted through anthropometric measurements and identification of nutritional risk factors. This activity aimed to help meet the community's nutritional needs during the recovery period and prevent nutritional decline due to the impact of the disaster.

Health and nutrition education activities were conducted using interactive lectures, group discussions, question-and-answer sessions, and individual consultations. The materials covered clean and healthy living behaviors, post-disaster infectious disease prevention, the importance of environmental sanitation, ensuring balanced nutrition for vulnerable groups, and efforts to maintain health during the recovery period. To enhance the effectiveness of information delivery, educational activities were supported by leaflets and health posters distributed to participants.

Activity evaluation was conducted through process and outcome evaluation. Process evaluation assessed participant attendance, community participation, activity implementation, and the achievement of each program stage. Outcome evaluation used pre- and post-test questionnaires to measure changes in participants' knowledge of post-disaster health and nutrition. Additionally, the number of beneficiaries, health examination results, and distribution of aid to participants were recorded.

The data obtained were analyzed descriptively and quantitatively. Participant characteristics, health examination results, and aid distribution were presented in frequencies and percentages. Changes in participant knowledge levels were analyzed by comparing average pre-test and post-test scores to determine the effectiveness of the educational activities. The analysis results were then presented in tables and descriptive narratives to illustrate the program's achievements.

Indicators of activity success include: (1) at least 80% of the 65 participants participated in the entire series of activities; (2) there was an increase in the average knowledge score of participants after education; (3) all participants gained access to basic health services during the activity; and (4) health and nutrition assistance was distributed to all vulnerable groups targeted by the program. The evaluation results were used as a basis for compiling recommendations for the development of sustainable health and nutrition programs for disaster-affected communities in Batipuh District, Tanah Datar Regency.

RESULTS

1. Characteristics of Activity Participants

Table 1. Characteristics of Community Service Participants

Characteristics	Frequency (n)	Percentage (%)
Gender		
Man	22	33.8
Woman	43	66.2
Vulnerable Groups		
Toddler	15	23.1
Children	10	15.4
Pregnant mother	8	12.3
Breastfeeding mothers	7	10.8
Elderly	20	30.8
Persons with Disabilities	5	7.7
Total	65	100

Participant characteristics indicate that the community service program successfully reached various vulnerable groups, the primary targets of post-disaster health and nutrition interventions. Female participants were more involved, as most vulnerable groups comprised pregnant women, breastfeeding mothers, and caregivers of young children. Furthermore, the elderly were the largest target group requiring ongoing health services due to their high risk of health problems during the post-disaster recovery period. These findings demonstrate that the program was well-targeted in reaching populations with the highest health and nutrition needs.

2. Basic Health Examination Results

Table 2. Participant Health Screening Results

Types of Health Findings	Frequency (n)	Percentage (%)
Good health condition	27	41.5
Mild-moderate hypertension	18	27.7
ARI	8	12.3
Complaints of digestive disorders	6	9.2
Complaints of skin disease	4	6.2
Other complaints	2	3.1
Total	65	100

Health screening results showed that some participants still experienced various health problems commonly found in disaster-affected communities. The complaints predominantly concerned non-communicable diseases and health problems related to post-disaster environmental conditions. The presence of respiratory infections, digestive disorders, and skin diseases indicated that sanitation, environmental quality, and healthy lifestyles remained challenges during the recovery period. These findings highlight the importance of basic health services for early detection and management of health problems in vulnerable groups.



3. Results of Monitoring the Nutritional Status of Vulnerable Groups

Table 3. Nutritional Status of Participants Based on Anthropometric Measurement Results

Nutritional status	Frequency (n)	Percentage (%)
Good	39	60.0
At Risk of Malnutrition	18	27.7
Malnutrition	8	12.3
Total	65	100

Nutritional status monitoring showed that the majority of participants were in the well-nourished category, but there were still groups at risk of malnutrition or showing signs of malnutrition. This indicates that the impact of the disaster continues to impact the community's ability to meet their daily nutritional needs. Toddlers, pregnant women, breastfeeding mothers, and the elderly are groups that require special attention because they have higher nutritional needs than other groups. These findings reinforce the importance of nutritious food aid interventions and nutrition education during the recovery process.

4. Distribution of Health and Nutrition Assistance

Table 4. Distribution of Assistance to Participants

Types of Assistance	Number of Recipients	Coverage (%)
Basic health check	65	100
Health consultation	65	100
Nutritious food package	65	100
Health and nutrition education leaflet	65	100
Referral to health facility	12	18.5

Program implementation demonstrated that all participants received access to basic health services and nutritional assistance in accordance with established targets. The equitable distribution of aid demonstrated effective coordination between the community service team, health workers, and local government. In addition to providing direct assistance, this activity also successfully identified participants requiring follow-up health services, enabling them to receive more comprehensive treatment through the referral system.

5. Changes in Participants' Knowledge Level

Table 5. Comparison of Pre-Test and Post-Test Values for Health and Nutrition Knowledge

Variable	Mean $\pm$ SD	Mean Difference (95% CI)	t	p-value	Cohen's d
Pre-test	61.38 $\pm$ 10.24	23.39 (20.10–26.68)	17.82	<0.001	1.82
Post-test	84.77 $\pm$ 8.16				

Evaluation of the educational intervention demonstrated a substantial improvement in participants' knowledge regarding post-disaster health and nutrition. The mean knowledge score increased from 61.38 $\pm$ 10.24 before the intervention to 84.77 $\pm$ 8.16 after the intervention, representing a mean increase of 23.39 points (38.1%). Statistical analysis indicated that this improvement was statistically significant ($p < 0.001$), suggesting that the educational activities effectively enhanced participants' understanding of healthy behaviours, nutrition management, environmental sanitation, and disease prevention during the post-disaster recovery period.

6. Evaluation of Program Achievements

Table 6. Achievement of Program Success Indicators

Indicator	Target	Achievements	Status
Attendance of participants	≥80%	95.4%	Achieved
Increased knowledge	Increase	Increase	Achieved
Access to basic health services	100% participants	100%	Achieved
Distribution of health and nutrition aid	100% target	100%	Achieved

The program evaluation showed that all success indicators were successfully achieved. High participant participation reflected the community's strong need for post-disaster health and nutrition services. Achieving aid distribution targets and improving participant knowledge demonstrated that the program was effective and provided tangible benefits to vulnerable groups. These results confirm that a participatory approach involving communities and local stakeholders can support the success of health and nutrition interventions in disaster-affected areas.

DISCUSSION

1. Participant Health Screening Results

Health screening results showed that more than half of the participants (58.5%) still experienced various post-disaster health problems, with the most common finding being mild to moderate hypertension (27.7%), followed by Acute Respiratory Tract Infections (ARI) at 12.3%. These findings align with the results of integrated post-disaster health services in Agam Regency, West Sumatra, which reported that hypertension and ARI cases dominated patient visits in disaster-affected areas (Gunawan et al., 2026). The high prevalence of hypertension in vulnerable groups is also supported by research by Bilgehan et al. (2025) who found that 34.87% of earthquake victims in Turkey experienced hypertension in the post-disaster period (Bilgehan et al., 2025). This condition reflects that post-disaster stress contributes significantly to increased blood pressure as explained in the concept of disaster-induced hypertension which is triggered by dysregulation of physiological homeostasis due to the acute stress response and increased post-disaster catecholamine levels.

The findings of ARI (12.3%), digestive disorders (9.2%), and skin diseases (6.2%) in this activity are in line with the pattern of infectious diseases commonly found in disaster-affected populations. Siddiq & Ihsan (2025) reported that in the 2022 West Pasaman earthquake evacuation site, airborne diseases (including ARI) reached 78.5% of the total cases in children, followed by water- and food-borne diseases (13%) (As Siddiqi & Ihsan, 2025). Landi et al. (2026) also identified ARI, diarrhea, and dermatitis as the three most common infectious diseases following flood disasters in Indonesia (Landi et al., 2026). Based on these findings, the researchers assume that the high rate of ARI in this activity reflects the crowded conditions of the evacuation site environment, lack of adequate ventilation, and exposure to dust and pollutants that cannot be avoided during the emergency response period. Similarly, the emergence of digestive disorders and skin diseases indicates limited access to clean water and low levels of clean and healthy living behavior among some of the affected communities.

The health check results also revealed that 41.5% of participants were recorded as being in good health. Researchers assume that this condition can be attributed to several factors, namely (1) the characteristics of the sample consisting of vulnerable groups with limited mobility and tending to spend more time indoors, thus reducing exposure to more severe environmental risk factors, (2)



early access to humanitarian aid that had been distributed before the implementation of the activities, and (3) the possibility of a healthy survivor effect where individuals with the worst health conditions were unable to participate in the activities. However, the presence of hypertension that is still high in the elderly group and ARI in the toddler group emphasizes that post-disaster basic health services must remain sustainable to prevent the worsening of existing clinical conditions or the emergence of extraordinary infectious disease events.

2. Monitoring the Nutritional Status of Vulnerable Groups

Based on the results of nutritional status monitoring, the majority of participants (60.0%) were in the good nutritional status category, but 27.7% of participants were included in the category at risk of malnutrition and another 12.3% had shown signs of malnutrition. This finding is in line with research by Hartini et al. (2025) in Palu City post-disaster, which showed that toddlers are the group most vulnerable to nutritional problems and food insecurity, with 23.8% of toddlers experiencing abnormal nutritional status despite adequate food distribution (Hartini et al., 2024). Kasim et al. (2025) also emphasized that toddlers face serious challenges in obtaining appropriate complementary foods during the evacuation period, which can increase the risk of stunting, wasting, and micronutrient deficiencies (Kasim et al., 2025).

Research by Cemali et al. (2025) on children aged 7–12 years living in temporary shelters after the Turkish earthquake found that 35.64% of children were underweight, 21.76% were stunted, and consumption of fruit, vegetables, meat, fish, and dairy products decreased significantly after the disaster (Berk et al., 2025). These cross-context findings strengthen the evidence that natural disasters consistently have a negative impact on food diversity and nutrient intake, especially in groups with high physiological needs. The researchers assume that the continued presence of groups at risk of malnutrition and undernutrition in this activity is caused by several interrelated factors: (1) disruption of the food distribution system in the early post-disaster phase so that access to nutritious food is limited, (2) the mismatch of food aid received by the community with the specific needs of vulnerable groups (for example, toddlers need complementary feeding, pregnant women need iron supplementation, and the elderly need easy-to-consume and low-fat foods), and (3) the low knowledge of some caregivers regarding fulfilling balanced nutrition in emergency situations.

The good nutritional status recorded in 60.0% of participants provides a positive indication that post-disaster recovery efforts in this region have progressed to some extent. However, this figure does not reflect ideal conditions because 40.0% of participants still have suboptimal nutritional status. Therefore, post-disaster nutrition interventions cannot simply rely on mass food distribution but must be tailored based on age group, physiological condition, and individual health status. Evidence-based interventions that include fortified ready-to-eat foods, locally based complementary feeding (MP-ASI), micronutrient supplementation, and education for caregivers have proven effective in reducing malnutrition rates in children under five years of age after a disaster.

3. Distribution of Health and Nutrition Assistance

The educational component of this PAR-based intervention resulted in a 38.1% improvement in participants' knowledge, demonstrating that participatory learning strategies are effective for strengthening community health literacy in disaster-affected settings. Interactive lectures, group

discussions, individual consultations, and printed educational materials enabled participants to better understand balanced nutrition, environmental sanitation, infectious disease prevention, and appropriate health practices during the recovery phase.

The observed increase is likely attributable to the participatory nature of the intervention, which encouraged active engagement rather than passive information transfer. Previous disaster-health education studies have consistently shown that community participation improves knowledge retention and facilitates behavioural change because learning is contextualized according to local needs and experiences. Moreover, integrating health education with direct health screening and nutritional assistance reinforces learning through immediate practical application, thereby increasing the likelihood that knowledge will translate into healthier practices.

These findings align with the results of a scoping review by Mohd et al. (2024) which identified that priority health interventions for vulnerable groups post-earthquake include humanitarian health assistance, medical care, and health promotion and education, with each receiving the highest priority scores (25, 17, and 9, respectively) (Balikuddembe et al., 2024).

The provision of nutritious food packages tailored to the needs of vulnerable groups in this activity reflects the nutritional intervention approach recommended by Kasim et al. (2025), including the distribution of ready-to-eat food, locally based complementary feeding (MP-ASI), micronutrient supplementation, and educational services for caregivers. Researchers assume that the coverage of aid distribution reaching 100% is influenced by several supporting factors, namely (1) the involvement of health cadres and village officials in the process of identifying and mobilizing targets, (2) the implementation of decentralized activities by visiting refugee locations to facilitate access for groups with limited mobility, (3) the availability of adequate logistics thanks to coordination with various parties, including higher education institutions and local governments. The home visit approach integrated in this activity is also in line with best practices reported by Gunawan et al. (2026) in the integrated health service program in West Sumatra (Gunawan et al., 2026).

The finding that 18.5% of participants (12 people) required referral to a health facility for further treatment indicates that the health screening successfully identified cases requiring more intensive intervention. This figure is relevant to the findings of Bilgehan et al. (2025) that the need for access to medicines, transportation to the hospital, disease-specific nutrition, and social support increased significantly in groups with non-communicable diseases after the earthquake (Bilgehan et al., 2025). The researchers assumed that the high proportion of referrals among the elderly and pregnant women was due to the high prevalence of poorly controlled hypertension and high-risk pregnancies that require further antenatal monitoring. The well-functioning referral system in this activity is an indicator that basic health services do not stop at providing short-term assistance, but are integrated with a sustainable referral health system.

Although this study demonstrated a statistically significant improvement in knowledge, the absence of a control group limits causal inference. Consequently, future studies employing quasi-experimental or controlled designs with longer follow-up periods are recommended to determine whether improvements in knowledge are sustained and lead to measurable behavioural and health outcomes.



4. Activity Limitations

This community service activity has several limitations that need to be acknowledged. First, the evaluation design used a pre-test and post-test without a control group, so the increase in participants' knowledge cannot be fully attributed to the intervention given due to the possible influence of other factors such as exposure to information from external sources during the activity period. Second, nutritional status measurements used only simple anthropometric indicators without supplementary biochemical tests (such as hemoglobin, albumin, or ferritin levels), thus unable to accurately detect micronutrient deficiencies that may occur in vulnerable groups. Third, the limited timeframe for the activity (January–March 2026) did not allow for a long-term evaluation to measure the sustainability of post-intervention behavioral changes and health status. Fourth, the purposive sampling technique may introduce selection bias, so the results of the activity may not be fully generalizable to the entire disaster-affected population in Batipuh District, Tanah Datar Regency. The researchers recommend that follow-up activities be designed with a quasi-experimental design that includes a control group and a long-term evaluation to measure the sustainability of the program's impact.

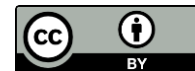
CONCLUSIONS

According to the research findings, the health and nutrition support programme based on Participatory Action Research (PAR) successfully reached 65 disaster-vulnerable groups in Batipuh Sub-district, Tanah Datar Regency, with a participant attendance rate of 95.4 per cent and 100 per cent coverage of health services and nutritional packages among the target population. Health screening results showed that hypertension (27.7 per cent), acute respiratory infections (12.3 per cent), digestive disorders (9.2 per cent) and skin diseases (6.2 per cent) were the most prevalent health issues. These findings confirm that environmental sanitation challenges and the adoption of clean and healthy living practices remain key risk factors in the post-disaster period; consequently, there is a need to strengthen early disease detection and enhance the capacity of village-level health cadres.

Nutritional status monitoring revealed that 60.0% of participants were well-nourished, but 27.7% were at risk of malnutrition and 12.3% were malnourished. This confirms that post-disaster nutrition interventions require a specific, individualized approach, including complementary feeding for toddlers, iron supplementation for pregnant women, and high-protein foods for the elderly.

Participants' knowledge increased by 38.1% (from 61.38 to 84.77), demonstrating the effectiveness of interactive education in improving public health literacy. 18.5% of participants were referred to health facilities, particularly elderly people with uncontrolled hypertension and high-risk pregnant women, underscoring the importance of an integrated referral system.

Recommended follow-up actions include ongoing support for at-risk groups, program integration into routine community health center services, training of health cadres, and further research with a quasi-experimental design to measure the intervention's long-term effectiveness. The development of a disaster-responsive health literacy model is also needed as a community-based disaster mitigation policy in disaster-prone areas.



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