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Warta Pengabdian Andalas

Jurnal Ilmiah Pengembangan dan Penerapan Ipteks

ISSN (Print) 0854-655X | ISSN (Online) 2797-1600

Improving the Quality of Life and Public Health of Vulnerable Groups after Flash Floods in Pandai Sikek Village

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Submitted: February 12, 2025 Accepted: September 28, 2025 Published: September 30, 2025

ABSTRACT

Nagari Pandai Sikek West Sumatra experienced a flash flood disaster that caused infrastructure damage, disruption of basic services, and decreased the quality of life of the community, especially vulnerable groups. This activity aims to improve the quality of life and health of post-disaster communities through an integrated approach in the fields of health and disaster management. The quality of life of the community is measured through a composite approach that includes knowledge improvement (pre- and post-tests), behavioral changes and participation in activities, simple health conditions (blood pressure and physical activity), waste bank and maggot-based environmental management, and community social involvement. These indicators show improvements in physical, cognitive, social, and environmental aspects after the community service activities. Activity methods include socialization, simulation, and education with a pre-test and post-test approach to measure the effectiveness of the intervention. Activities were carried out in the form of disaster mitigation counseling for elementary school students, maggot-based waste management training, healthy lifestyle counseling for the elderly through the GERMAS program, and nutrition education for parents related to stunting prevention. The results of the activity showed an increase in public understanding of disaster mitigation, with an average pre-test score of 58.4 increasing to 82.7 in the post-test. The community demonstrated a better understanding of the importance of waste management to prevent environmental pollution, awareness of early detection of hypertension, and the fulfillment of balanced nutrition to prevent stunting. Active participation in simulations, question and answer sessions, and discussions were indicators of the success of the activity. It can be concluded that this community service program succeeded in increasing the understanding and awareness of the Pandai Sikek community regarding health and disaster preparedness. The sustainability of this program needs to be supported through collaboration with local governments, educational institutions, and local communities to expand its positive impact.

Keywords: post disaster, quality of life, vulnerable groups

INTRODUCTION

Hypertension Nagari Pandai Sikek is one of the areas affected by the flash flood disaster (galodo) that occurred in West Sumatra on May 11, 2024. This Nagari is located in X Koto District, Tanah Datar Regency. Pandai Sikek Kenagarian has great potential in agriculture, traditional weaving crafts, and cultural tourism which can be the main pillars

DOI: https://doi.org/10.25077/jwa.32.3.357-366.2025

for post-disaster economic recovery and development. However, the area also faces a range of serious problems, particularly in the aftermath of the flash floods that damaged vital infrastructure, disrupted access to basic services, and degraded people's quality of life. Damage to health facilities, schools and major roads complicated relief and recovery efforts. Vulnerable groups such as children, the elderly, pregnant women and people with disabilities had greater difficulty accessing basic needs and health services (Shah et al., 2020).

In addition, problems with clean water and poor sanitation increase the risk of infectious diseases (World Health Organization, no date). Economic challenges are also significant, with many residents losing their livelihoods due to damage to agricultural land and small businesses (Water and Sanitation Program, 2011). Coordination between government, NGOs and local communities is needed to address these issues and harness the potential to rebuild more resilient and self-reliant communities (Shah et al., 2020).

Urgent measures include repairing damaged infrastructure, such as roads, bridges, and health facilities, as well as rebuilding destroyed homes to ensure community safety and well-being. Strengthening early warning systems and disaster risk mitigation are also essential to increase the region's resilience to future disasters. In addition, rehabilitation programs and skills training are needed to help communities restore their livelihoods, including assistance in micro and small business development. Intensive health and sanitation education should also be conducted to prevent the spread of disease and raise awareness of the importance of hygienic practices. Through well-coordinated collaborative efforts, it is hoped that the region can gradually recover, with improved quality of life and overall community well-being (Shah et al., 2020) .

Vulnerable groups, such as children, the elderly, pregnant women, and people with disabilities, require improvements in their quality of life and health in the aftermath of disasters as they are vulnerable to more severe impacts of such disaster (World Health Organization, 2023) (Pujiatun et al., 2023). First, these groups often have limited access to basic resources and services, such as clean water, food and health services. Disasters often exacerbate these inequalities in access, increasing the risk of malnutrition, infectious diseases and other health problems (Columbia Climate School National Center for Disaster Preparedness, no date). Second, vulnerable groups may experience greater physical and mental trauma from disasters, such as loss of family, home or financial security. Psychosocial support and mental health services are essential for them to cope with the psychological impact of disasters (Wahyuni, 2021). Third, post-disaster environmental conditions, such as poor sanitation and infrastructure damage, can increase the risk of illness and injury, especially for vulnerable groups who are susceptible to unhealthy environmental conditions (Departement Health and Human Service USA, 2021). Improving the quality of life and health of vulnerable groups is therefore a priority to ensure that they can recover holistically and get the support they need to rebuild their lives post-disaster. The post-disaster conditions have increased the risk of infectious diseases, stunting, and non-communicable diseases due to limited sanitation, clean water, and access to health services. Therefore, integrated interventions are needed through health education, environmental management, and community capacity building so that they can adapt, recover, and build resilience to face future disasters.

This activity is integrated with the Merdeka Learning Campus Merdeka (MBKM) disaster program which is integrated with Real Work Lecture (KKN) activities. The integration of community service activities with the Merdeka Learning Campus Merdeka (MBKM) disaster program connected to the Real Work Lecture (KKN) can be a very effective step in dealing with disasters and strengthening student involvement in post-disaster recovery efforts. By integrating these activities with the disaster MBKM program

and KKN, students can have valuable practical experience in coping with actual disasters, while contributing their knowledge and skills to support the recovery of local communities.

There are several solutions offered to solve the problems in Nagari Pandai Sikek. First, providing education and training related to disaster mitigation to elementary students from an early age helps them to increase preparedness in the face of natural disasters. Second, increasing public awareness in environmental health through waste management due to disasters. Third, prevent hypertension in the elderly through GERMAS. Fourth, conducting nutrition counseling and stunting prevention.

METHOD

This Activities in Nagari Pandai Sikek use a participatory approach with educational, simulation, and demonstration methods designed to address the needs of post-disaster communities. Each program is designed to address specific challenges and involves various target groups to ensure comprehensive community involvement.

The activity design focuses on counseling, simulation, field practice, and interactive discussions. This approach was chosen so that participants not only gain theoretical knowledge but also develop practical skills relevant to their daily needs after a disaster.

Data collection techniques were carried out in three ways. First, pre-tests and post-tests were used to measure participants' knowledge improvement, especially in nutrition education activities for stunting prevention. Second, observations were made on participants' participation and involvement in disaster simulations, elderly gymnastics, and waste management practices. Third, interviews and brief discussions were conducted to explore participants' commitment to implementing the results of the activities.

Each activity has clear stages and procedures. Disaster mitigation socialization was carried out on September 21 and 28 and October 5, 2024, at five elementary schools (SDN 06, SDN 27, SDN 16, SDN 10, and SDN 02) involving around 200 students. The methods used included providing material through presentations, interactive question and answer sessions, and evacuation simulations. The success of the program was measured by the students' activity during the simulation sessions and their increased understanding as measured through discussions.

Post-disaster environmental health activities were held on October 8, 2024, at Balai Jorong Pagu-Pagu, involving more than 30 participants. The activities included socialization and demonstrations of waste management based on waste banks and maggot cultivation as economical and ecological solutions after disasters. Success indicators were demonstrated through participants' enthusiasm in discussions and their commitment to begin managing waste independently.

Next, hypertension prevention activities for the elderly through GERMAS were held at the Balai Jorong Koto Tinggi on September 20 and October 2, 2024. Participants consisted of around 80 elderly people and posyandu cadres. The program began with group exercises, followed by blood pressure measurements, information about hypertension, and the distribution of fruit as part of healthy eating education. The success of the activity was measured based on participants' questions during the information session and their understanding of the importance of a healthy lifestyle in preventing hypertension.

The final activity, Nutrition Information for Parents to Prevent Stunting, was held at the Pandai Sikek Village Office Hall on November 13, 2024, with more than 20 parents whose children were recorded as stunted participating. The counseling was conducted by doctors from the community health center using a pre-test and post-test approach to measure participants' understanding. The indicators of the activity's success were shown

through an increase in knowledge scores between the pre-test and post-test results, as well as the parents' involvement in interactive discussions.

The tools and materials used in this activity included simulation tools for disaster evacuation, presentation media in the form of projectors and educational leaflets, tensimeters for blood pressure checks, and fruits used as part of healthy eating education.

The effectiveness of the program is measured through three aspects. The cognitive aspect is indicated by an increase in pre-test and post-test scores. The participation aspect is seen from the participants' activeness in discussions, simulations, and practices. Meanwhile, the sustainability aspect is measured from the community's commitment to consistently apply the results of the activities, such as independent waste management, regular exercise, and the application of a balanced diet in the family.

RESULTS AND DISCUSSION

Disaster Mitigation Socialization

A disaster mitigation socialization program was implemented for elementary school students in Nagari Pandai Sikek with the aim of improving their knowledge and skills in dealing with disasters. The program includes three main stages: theoretical socialization, practical training, and emergency action simulations for earthquakes, flash floods, and volcanic eruptions.

The implementation of the activity began with the provision of materials designed in an interactive manner to ensure students understand the basic concepts of disaster mitigation, such as the correct way to evacuate, the important role of emergency communication, and self-protection. Next, practical training sessions provided hands-on experience for students in using props and safety procedures.

The simulation ended with an evaluation session involving a Q&A to assess the students' level of understanding. Indicators of the program's success include the attendance of more than 200 students from five elementary schools in Nagari Pandai Sikek, an increase in active participation as evidenced by their enthusiasm in asking questions and engagement in demonstrations, as well as observation results showing their ability to perform safety actions correctly. In addition, the program had a positive impact on the teachers involved, with a reported increase in their awareness of the importance of disaster mitigation education in schools. Challenges such as student orderliness during the activities have been overcome with more effective strategies, such as the division of small groups and direct assistance by facilitators.

Figure.1 Disaster mitigation socialization

This activity successfully educated students about disaster mitigation through theoretical and practical approaches. The active participation of students reflects the effectiveness of interactive learning methods. However, the challenge faced was the lack of student order during the activity. This can be overcome by increasing supervision and making the rules clearer before the simulation.

In line with the objectives of this program, an article by Prambudi (2018) entitled "Integration of Disaster Mitigation Education in Elementary School Curriculum" emphasizes the importance of incorporating disaster mitigation education into the school curriculum. The research outlines strategies such as simulations and multimedia resources to effectively engage students. The research findings show that early education on disaster risk can significantly improve community awareness and individual preparedness (Inang Prambudi, 2018). Anwar and Rizal's study (2018) also highlighted how structured programs can improve children's knowledge of disaster preparedness and response. The results showed a positive correlation between active participation in simulations and increased understanding of safety measures during disasters (Anwar & Rizal, 2018).

Post-Disaster Environmental Health

This program aims to educate the community about post-disaster waste management, which is often a serious problem after natural disasters. This activity involved maggot and waste bank experts who provided material on organic and inorganic waste management, as well as utilizing maggot as a solution to organic waste management.

The socialization session was complemented by live demonstrations on how to raise maggots, waste management into economic value products, and environmentally friendly waste treatment techniques. Interactive discussions were also held, where the community raised questions related to waste management in their neighborhood. The attendance of more than 30 participants, which included representatives of nagari guardians, Posyandu cadres, and the general public, showed high concern for this issue.

The positive impact of this activity is the increased understanding of the community about the importance of waste management to prevent environmental pollution. In addition, the community gained new insights into the economic potential of waste through waste banks and maggot cultivation. The evaluation of the activity showed that participants felt motivated to start implementing waste management independently in their respective homes.

Figure.2 Waste management and maggot cultivation activities

The counseling highlighted the importance of community and stakeholder collaboration in post-disaster waste management. Involving maggot experts and waste banks is an important innovation to increase the effectiveness of the program. Challenges in the form of audience inconduciveness can be minimized by involving more youth and other sectors.

The results of the research by Sitepu et al. (2019) shows a positive direction, because the efforts made by the Waste Bank manager have been able to change the behavior of the people of nagari Simpang, Simpang Alahan Mati District to be more concerned about environment (Sitepu et al., 2019).

In line with a report from the United States Department of Health and Human Services, the "Predicting Environmental Health Risks for Post-Disaster Recovery" report discusses the importance of community engagement in managing environmental health hazards after a disaster. The report highlights that effective communication and education on environmental risks can empower communities to take proactive measures, such as waste management and sanitation, which is in line with the objectives of this program to raise awareness on waste management alternatives such as waste banks and moggot cultivation (Department of Health and Human Services, 2019).

This is in line with research conducted by Izzalqueny et al. (2025), which found that organic waste management through maggots, biopores, and composters has been proven to improve the economic welfare of communities by providing them with the skills to manage waste sustainably, which is beneficial for the environment and the local economy (Izzalqurny et al., 2025).

Efforts to Prevent Hypertension in the Elderly

This activity is carried out through the Healthy Living Community Movement program which aims to increase public awareness, especially the elderly, of the importance of a healthy lifestyle to prevent hypertension. This program was carried out in two sessions consisting of gymnastics together, providing educational materials related to the dangers of hypertension, as well as the importance of a healthy diet and physical activity.

The joint gymnastics activity was held at Jorong Koto Tinggi Hall and attended by around 20 participants in each session, including puskesmas cadres and elderly women from the local neighborhood. The socialization provided by the village midwife focused on the introduction of hypertension risk factors, symptoms that are often overlooked, as well as preventive measures that can be taken daily. To strengthen the participants' understanding, a question and answer session was organized with high enthusiasm from the community.

The results of the activity showed an increase in community awareness of the dangers of hypertension and the importance of early detection through regular blood pressure checks. The community also began to understand the benefits of consuming nutritious food and exercising regularly as part of a healthy lifestyle. The impact of this activity can be seen in the liveliness of participants who show great interest in continuing gymnastic activities independently as an effort to maintain health.

The integration of GERMAS in this program emphasizes the importance of a promotive approach to prevent hypertension. Joint gymnastics activities provide physical benefits and build community togetherness. The constraints of distant locations can be overcome by providing transportation or holding activities in locations that are more accessible to the elderly.

Research from Oliveros et al. (2020) discussed the importance of non-pharmacological lifestyle interventions to reduce the risk of hypertension. This study emphasizes that encouraging physical activity, dietary changes, and regular health check-ups are important components of hypertension management in the elderly population. This

supports this program in integrating exercise, blood pressure monitoring, and healthy dietary practices into health programs for the elderly (Oliveros et al., 2020).

Figure.3 Hypertension prevention activities in the elderly through the Healthy Living Community Movement Program (GERMAS)

Research from Sasarari et al. (2024) on "Physical Activity as an Effort to Prevent Hypertension in the Elderly" highlights the important role of regular physical activity in preventing and managing hypertension in the elderly. The study showed that doing various forms of exercise can lower blood pressure and improve overall cardiovascular health, which is in line with the focus of this program (A. Sasarari et al., 2024).

Research by Ilmi, Marjan, & Anwar (2024) also highlights risk factors for hypertension in pre-elderly and elderly people, particularly nutritional status and sodium intake, which reinforces the urgency of intervention programs based on healthy lifestyle education. This is in line with the spirit of the Healthy Living Community Movement (GERMAS), which emphasizes the importance of diet, physical activity, and regular health checkups (Wirayudha, Ilmi and Marjan, 2024).

Nutrition Socialization to Parents for Child Growth and Development

This program targets parents of stunted children in Nagari Pandai Sikek, aiming to provide education about the importance of nutrition in supporting children's growth and development. The activity began with a pre-test to measure parents' initial understanding of children's nutritional needs. The socialization material was delivered by health workers from the puskesmas who explained the importance of a balanced diet, the long-term impact of malnutrition, and practical steps to prevent stunting.

During the session, parents were invited to have an active discussion, discuss the obstacles they face in providing adequate nutrition for their children, and get solutions from experts. Providing examples of healthy food menus that are easily accessible is part of the socialization to facilitate implementation by the community. After the education session, a post-test was conducted to evaluate the participants' knowledge improvement.

Table 1. Parents' Level of Knowledge of Child Stunting in Nagari Pandai Sikek in 2024

Test Results	Mean	SD	p-value
Pre Test	76,25	15,0	0,004
Post Test	90,00	11,9	

Based on table 1 after being given counseling related to "Nutrition Counseling and Stunting Prevention" to parents there was an increase in knowledge from an average (pre test) of 76.25 to (post test) 90.00. The T test results obtained p value = 0.004. This means that statistically there is a significant difference between the pre-test results before counseling and the post-test results after counseling.

The results of this activity showed the attendance of more than 20 people, with a significant increase in knowledge scores based on the post-test results. In addition, many parents expressed their commitment to pay more attention to their children's nutritional needs. The impact of this program includes increased awareness of the importance of adequate nutrition and understanding of how to prevent stunting early on, which is expected to support national efforts to reduce stunting rates in the region.

Figure.4 Socialization of nutrition to parents on child growth and development during disasters

This program is relevant to national efforts to reduce stunting. The increase in parents' understanding through pre-test and post-test shows the effectiveness of the material delivery. In line with research by Azrimaidaliza et al. (2020), this educational activity is quite effective in increasing the knowledge of the target activities on Stunting Prevention in the Working Area of Pusksmas Pauh, Padang City (Azrimaidaliza et al., 2020).

Family involvement is critical for effective stunting interventions. A review by Bahar (2023) emphasizes that increased parental knowledge about nutrition directly contributes to better dietary practices for their children. This supports the findings in this activity that parents showed increased awareness about nutrition after the nutrition counseling program.

Overall, these four work programs had a positive impact on the community of Nagari Pandai Sikek, especially in raising awareness of disaster mitigation, environmental health, hypertension prevention, and the importance of child nutrition. Cross-sectoral involvement and the utilization of interactive methods are key to the success of these activities.

CONCLUSION

Based on the implementation of the community service program in Nagari Pandai Sikek, it can be concluded that this activity has successfully achieved its objectives, namely improving the quality of life and health of vulnerable groups after flash floods through health education and environmental management. This can be seen from the significant increase in participants' understanding of disaster mitigation, waste management based on waste banks and maggots, prevention of hypertension in the elderly through the GERMAS program, and increased knowledge of parents about balanced nutrition to prevent stunting. Active community participation in discussions, simulations, and field practices was an indicator of the success of the activities.

However, the implementation of the program also faced several obstacles. The challenges that arose included the limited discipline of students during disaster mitigation simulations, limited supporting facilities and infrastructure, especially in activities for the elderly that were constrained by location, and the audience's lack of enthusiasm during waste management counseling. These obstacles can be overcome through more effective strategies, such as dividing participants into smaller groups, increasing supervision, choosing more accessible locations, and involving more youth and community cadres.

For the sustainability of the program, cross-sector support is needed through collaboration with the local government, health centers, schools, and local communities. This program has the potential to be developed more broadly through integration with routine community activities such as integrated health service posts, youth organizations, and school activities, so that the results that have been achieved can be maintained and expanded. In addition, the active involvement of the younger generation is very important to maintain the sustainability of the program, while strengthening the capacity of the community in dealing with disasters and maintaining environmental health.

ACKNOWLEDGMENT

The authors would like to thank the Institute for Research and Community Service of Andalas University for funding support in the implementation of this activity (Contract number: 74/UN16.19/PM.03.03/PKM-TKM/2024). We also thank Kenagarian Pandai Sikek, X Koto District Tanah Datar Regency, West Sumatra Province for giving permission to the author to carry out this activity. Our gratitude also goes to the entire community of Nagari Pandai Sikek who have participated in this activity. This support made it possible to carry out educational activities and concrete actions that have a positive impact on the community and the environment of Nagari Pandai Sikek.

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