

Effectiveness of Family-Based Education to Improve Disaster Preparedness among Mount Merapi Residents

Ilma Widiya Sari¹, Ahmad Syamsul Bahri², Hana Rosiana Ulfah³

¹Lecturer of Nursing Study Program, STIKES Estu Utomo, Indonesia

Article Info

Article history:

Received April 03, 2022

Revised April 28, 2022

Accepted May 06, 2022

Corresponding Author:

Ilma Widiya Sari
Lecturer of Nursing Study
Program
STIKES Estu Utomo
Indonesia
Email: ilmawidi@gmail.com

ABSTRACT

Disasters can occur at any time in any part of the world with impacts on individuals, families and communities resulting in threats to the quality of life. Preparedness is the activities and steps taken in advance to ensure an effective response to the impact of a disaster. It takes the community in increasing preparedness for disasters by providing family-based education about disaster preparedness. This study aims to determine the effectiveness of family-based education in improving disaster preparedness. This research is a pre-experimental study with a post-test and pre-test one group design. The population of this research is families who live in areas prone to volcanic disasters. Samples were taken as many as 37 families with simple random sampling technique. The independent variable is family-based education and the dependent variable is disaster preparedness. The research data were analyzed to determine the difference in disaster preparedness during the pre-test and post-test using a paired t-test. The difference in the mean value of disaster preparedness before and after the intervention was statistically significant. The p-value was smaller than alpha ($0.00 < 0.05$), it can be concluded that family-based education is effective to improve disaster preparedness. Family-based education can help and encourage families to explore their strengths so that they can improve disaster preparedness.

Keywords:

Disaster, Preparedness, Family-based education

This article is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/).



1. INTRODUCTION

Indonesia is a country that has a fairly high potential for natural disasters. Indonesian territory, including disaster-prone areas, especially geological natural disasters, geographically, Indonesia is located at the confluence of 3 (three) world tectonic plates, namely the Indian-Australian Plate in the south, the Eurasian Plate in the west and the Pacific Plate in the east. The plate boundaries are a series of world volcanoes, which encircle the Pacific Ocean called the Pacific Ring of Fire. The series then met with the Mediterranean series and then formed volcanoes in Sumatra, Java and Nusa Tenggara.[1]

Volcanic eruptions are one of the natural disasters that have the potential to threaten people's lives. Natural disasters are defined as geological events caused by nature, changes in weather patterns, or biological disasters due to the actions of living things.[2] Mount Merapi is an active volcano with a fairly frequent eruption frequency. Small eruptions of Mount Merapi occur every 2-3 years while large eruptions occur every 10-15 years. Based on data from BNPB, in the last five years there have been 8 eruptions.[3]

The eruption of Mount Merapi occurred marked by raised status from alert (level 2) to standby (level 3). Mount Merapi belongs to most active mountain all year round with short rest time no more on average 3,5 years from 1990 to now.[4] Eruption is a permanent threat with volcanic activity that can continue for months. This is due

to the uncertainty related to eruption behavior which is a challenge in disaster management.[5]

Disasters can occur at any time in any part of the world with impacts on individuals, families and communities resulting in threats to the quality of life.[6] Disasters occur when vulnerable people are faced with threats that they are unable to overcome or have low ability to cope with. The combination of the two causes disruption of people's lives. Disasters have a huge impact on humans and the surrounding environment such as mass death, disability, hunger, poverty and infrastructure destruction. [7], [8]

Preparedness is the most critical phase in the range of disaster management, inadequate disaster preparedness planning has created suffering for survivors and loss of life.[9] The purpose of preparedness planning is to obtain communities that are ready to face and respond to various types of emergency situations. Preparedness planning based on individual and family responsibilities is the main focus for improvement. This is because the role of the head of the family can play a role in conveying information to his family, influencing family members in making quick decisions and being able to as well as a source of social support for his family. [6], [10]

Several studies in Indonesia show that there are still weak efforts for emergency preparedness and handling to deal with disasters independently and proactively. This is reflected in the study of community preparedness in dealing with disasters in several areas by assessing the preparedness index in terms of individuals and families, school communities and the government which are still low in the category of being unprepared. [11]

Preparedness is planning actions to respond when a disaster occurs. Preparedness can also be interpreted as a situation where people or communities are ready to face disasters or emergencies.[12] The attitude that is carried out to anticipate the possibility of a disaster to avoid the occurrence of casualties, loss of property, and changes in the way of life of the community is the attitude of preparedness. [13]

Preparedness efforts to deal with disasters by involving key stakeholders such as individuals, households, and the government. Supporting stakeholders such as community institutions. Individuals and households are the spearheads, subjects, and objects of preparedness that directly affect disaster risk.[14] Preparedness is a form of planning, identification of resources, warning systems, training, stimulation and other pre-disaster actions aimed at increasing the security and effectiveness of community responses during disasters.[15]

Preparedness is the activities and steps taken in advance to ensure an effective response to the impact of a disaster, including the timely and effective issuance of early warning and temporary evacuation of people and property from threatened locations. Characteristics of the community are still not aware of the preparedness that must be done to reduce disaster risk such as knowledge of disasters, early warning, and emergency response when they occur. [16]

Preparedness is a series of activities carried out to anticipate disasters through organization and through appropriate and efficient steps. Preparedness is one part of the disaster management process and in the current concept of disaster management. Increased preparedness is one of the important elements of proactive disaster risk reduction activities, before a disaster occurs. People who are ready to be alert tend to be able to act quickly and precisely when a disaster occurs, while people who are not ready to be prepared will tend to experience panic when facing a disaster. This situation greatly affects the safety of the community, so that the preparedness that exists in the community will be able to reduce the adverse effects caused in the event of a disaster.[17]

Preparedness to deal with a disaster should someone know the things or actions that will be taken against disasters that will occur or are happening. Communities must have the ability to deal with disasters. Preparedness relates to sufficient knowledge of the community about disasters that often occur as well as prevention and resilience to disasters. Preparedness to deal with a disaster someone should know the things or actions that will be taken against disasters that will occur or are happening. Communities must have the ability to deal with disasters. Preparedness relates to sufficient knowledge of the community about disasters that often occur as well as prevention and resilience to disasters. Providing education about volcanic disaster preparedness on knowledge of self-rescue procedures is very necessary for the local community because they remember and see the geographical location.[18]

It is important for the community to know the handling of disaster preparedness because the factor that causes the large number of victims is due to a lack of knowledge and community preparedness in dealing with disasters. Therefore, it takes the community in increasing knowledge and preparedness for disasters by providing education about disaster preparedness.[19] Disaster preparedness education is a form of activity in providing an understanding of the initial steps to save yourself and find a safe place in the event of a disaster.[20]

Research on family-based education has been carried out by several researchers, revealing that family-based interventions are proven to be effective in helping and encouraging families to overcome the health problems they experience. Family-based education is proven to increase family awareness and self-esteem causing efficient care. Similarly, other studies have also shown that family-based education programs are effective in increasing knowledge and self-care in patients. [21]

A preliminary study conducted on the community on the slopes of Mount Merapi, Samiran Village, Selo District, Boyolali Regency. It was found that 15 out of 20 families had never received disaster education. Interviews conducted with 20 heads of families stated that 17 families said they were not ready in the event of a volcanic eruption. Based on this background, a study was conducted to determine the effectiveness of family-based education to improve disaster preparedness.

2. METHOD

This research is a pre-experimental study with a post-test and pre-test one group design. This study did not use a control group, but the initial measurements before the intervention can be used as a basis for testing changes that occur after the intervention. Education is given to the whole family about disaster preparedness. At the end of the study, preparedness measurements were carried out so that the comparison of subjects before and after being given family education was known.

The population of this research is families who live in areas prone to volcanic disasters. Samples were taken as many as 37 families with simple random sampling technique. The independent variable is family-based education and the dependent variable is disaster preparedness for the head of the family. The disaster preparedness instrument was modified from Ramadhan (2019) with 25 statements, consisting of emergency response mechanisms, provision of infrastructure, early warning systems and disaster emergency response procedures.[22]

The research data were analyzed to determine the difference in disaster preparedness during the pre-test and post-test. The normality test is carried out first to determine the statistical test to be used. The normality test used the Saphiro Wilk test with a sample of less than 50. The results of the normality test showed that the data distribution was normal so that the bivariate analysis was carried out using a parametric test using a paired t-test.

3. RESULTS AND DISCUSSION

The differences in disaster preparedness before and after the family-based education was analyzed by paired t-test. The results are presented in this table:

Table 1. Paired t-test result

Variable	Mean	Std. Deviation	P-value
Disaster preparedness before intervention	10.59	3.34	0.00
Disaster preparedness after intervention	14.40	3.20	

The results of the analysis show that the average value of disaster preparedness before and after the intervention increased. The difference in the mean value of disaster preparedness before and after the intervention was statistically significant, where the p-value was smaller than alpha ($0.00 < 0.05$). It can be concluded that family-based education is effective to improve disaster preparedness.

Education is an activity or effort to convey a message to the community, group or individual. With the hope that with this message the community, group, or individual can gain better knowledge. After being given education about preparedness in dealing with disasters, there are differences in the level of knowledge as expected.[19]

Health education is a process that can improve a person's health status. Health education can be provided to all targets, but must use the right method so that the information provided can be received well. This approach to fostered families is an illustration for health services and the provision of education is important and needs to be carried out continuously. And also the pattern of home visits in monitoring family conditions can be used as a means to optimize public health.[23]

The role of the family is very important and strategic in order to achieve prosperity including realizing optimal family health status. Disrupted family functions will have an impact on health status. To overcome all these problems, efforts are needed to increase the role of the family in carrying out its functions, one of which is through family-based education. [24]

Family-based education can increase the intention to change behavior. Providing education will encourage the occurrence of knowledge, changes in attitudes, behavior, and skills of a person or group in a reasonable manner. Family-based research has been carried out by several researchers, including revealing that family-based interventions are proven to be effective in helping change behavior to overcome health problems. The results of this study indicate that family-based educational therapy shows a decrease in anxiety levels from the information provided and explains understanding the main task of the family in health. This shows that the family understands better, especially about health conditions.[21]

Family-based education can change healthy behavior, besides family-based education is a dynamic process to change behavior by conveying information about health to individuals and families, but not a procedure that is directly applied or in the form of results that must be achieved. Information can help speed up someone to gain knowledge. Education is also a process of activities needed to increase individual independence and can make decisions consciously and can affect themselves, their families and society. [25]

Providing education about volcanic disaster preparedness on knowledge of self-rescue procedures is very necessary for families because they remember and see the geographical location that is close to an active detected mountain. So this is necessary for community preparedness so that they can face disasters that may occur at any time. [18] Good knowledge can have an impact on the attitude of community preparedness in disasters. Reduction of the impact of disaster risk can also be achieved with good disaster preparedness. Education about disaster mitigation can increase people's willingness to be active in disaster preparedness. [26]

4. CONCLUSION

The results of the study concluded that family-based education is effective to improve disaster preparedness. Family-based education can help and encourage families to explore their strengths so that they can improve disaster preparedness. Family-based education can be used as nursing interventions and health policies in disaster mitigation, especially family empowerment for disaster preparedness.

ACKNOWLEDGEMENTS

The authors would like to thank all those who have contributed to this process and the head of STIKES Estu Utomo who has sponsored research funds.

REFERENCES

- [1] G. Ibrahim and Subardjo, *Pengetahuan Seismologi*. Jakarta: Badan Meteorologi dan Geofisika, 2005.
- [2] S. Baack and D. Alfred, "Nurses' Preparedness and Perceived Competence in Managing Disasters," *J. Nurs. Scholarsh.*, vol. 45, no. 3, 2013.
- [3] B. N. P. Bencana, "Data dan Informasi Bencana," 2019. [Online]. Available: <https://bnpb.cloud/dibi/laporan5a>
- [4] D. Widodo, "Analisis Penyebab Masyarakat Tetap Tinggal di Kawasan Rawan Bencana Gunung Merapi (Studi di Lereng Gunung Merapi Kecamatan Cangkringan , Kabupaten Sleman Daerah Istimewa Yogyakarta)," *Ilmu Lingkungan.*, vol. 15, no. 2, 2017, doi: 10.14710/jil.15.2.135-142.
- [5] P. J. Baxter and C. J. Horwell, "Impacts of Eruptions on Human Health," *The Encyclopedia of Volcanoes*. Elsevier, pp. 1035–1047, 2015.
- [6] International Council of Nurse and World Health Organization, *ICN Framework of Disaster Nursing Competencie*. Geneva: WHO/WPRO, 2009.
- [7] A. D. Puspongoro, *Kegawatdaruratan dan bencana: solusi dan petunjuk teknis penanggulangan medik dan kesehatan*, 1st ed. Jakarta: Rayyana Komunikasindo, 2016.
- [8] S. L. Ahmad, A. Ahsan, and M. Fathoni, "Factor Analysis Related To Family Preparedness Facing Disaster Impact in Ternate City of Maluku Utara Province," *J. Ilmu Keperawatan (Journal Nurs. Sci.)*, vol. 6, no. 1, pp. 108–123, 2018, doi: 10.21776/ub.jurnalilmukeperawatan(journalofnursingscience).2018.006.01.11.
- [9] Febriana, D. Sugiyanto, and Y. Abubakar, "Kesiapsiagaan Masyarakat Desa Siaga Bencana Dalam Menghadapi Gempa Bumi Di Kecamatan Meuraxa Kota Banda Aceh," *Ilmu Kebencanaan Pascasarj. Univ. Syiah Kuala*, vol. 2, no. 3, pp. 41–49, 2015.
- [10] J. Levac, D. Toal-Sullivan, and T. L. O'Sullivan, "Household emergency preparedness: A literature review," *J. Community Health*, vol. 37, no. 3, pp. 725–733, 2012, doi: 10.1007/s10900-011-9488-x.
- [11] Nugroho, *Preparedness Assessment Tools For Indonesia*. Jakarta: Humanitarian Forum Indonesia & MDM, 2015.
- [12] C. Adiwijaya, "Pengaruh Pngetahuan Kebencanaan dan Sikap Masyarakat Terhadap Kesiapsiagaan Menghadapi Bencana Tanah Longsor (Studi di Kelurahan Lawanggintang, Kecamatan Bogor Selatan, Kota Bogor)," *J. Prodi Manaj. Bencana*, vol. 3, no. 2, pp. 81–101, 2017, [Online]. Available: <http://jurnalprodi.idu.ac.id/index.php/MB/article/view/107>
- [13] P. N. Made, S. Sahrir, and L. Maryam, "Gambaran Pengetahuan Dan Sikap Tentang Kesiapsiagaan Bencana Pada Bidang Kedokteran Kesehatan (Bidokkes) Polda Maluku Tahun 2018," *Glob. Heal. Sci.*, vol. 3, no. 4, pp. 339–345, 2018.
- [14] A. Afik, A. Khoriyati, and I. Y. Pratama, "Tingkat Kesiapsiagaan Masyarakat Dibidang Kesehatan Dalam Menghadapi Dampak Erupsi Gunung Berapi," *J. Kesehat. Mesencephalon*, vol. 7, no. 1, 2021, doi: 10.36053/mesencephalon.v7i1.260.
- [15] D. Sari and W. Setyaningsih, "Kesiapsiagaan Masyarakat Dalam Menghadapi Bencana Gunung Merapi Pada Masa Pandemi Covid-19 Di Kecamatan Dukun, Kabupaten Magelang," *Edu Geogr.*, vol. 10, no. 1, pp. 59–65, 2022.
- [16] J. I. . Islamey and D. . Larasari, "Kajian Tingkat Kesiapsiagaan Masyarakat Dalam Menghadapi Bencana Letusan Gunung Kelud Pada Kawasan Rawan Bencana (Krb) li Di Desa Kebonrejo Kecamatan Kepung Kabupaten Kediri," *Swara Bhumi*, vol. 1, no. 1, 2020, [Online]. Available: <https://ejournal.unesa.ac.id/index.php/swara-bhumi/article/view/31786%0Ahttps://ejournal.unesa.ac.id/index.php/swara-bhumi/article/view/31786/28832>
- [17] Nurhalimah, I. G. A. Wesnawa, and I. B. M. Astawa, "Kesiapsiagaan Bencana Erupsi Gunung Baru Jari Pada Masyarakat Di Kecamatan Sembalun Kabupaten Lombok Timur," *J. Pendidik. Geogr. Undiksha*, vol. 5, no. 1, 2017, doi: 10.23887/jjpg.v5i1.20653.
- [18] J. Ponamon and B. Desmyandre, "Pengaruh edukasi kesiapsiagaan bencana gunung berapi terhadap pengetahuan prosedur penyelamatan diri di kelurahan kinilow," *E-Jurnal Sariputra*, vol. 8, no. 2, pp. 9–14, 2021.
- [19] D. L. Romdhonah, A. Sucipto, and C. D. Y. Nekada, "Pengaruh Edukasi Managemen Bencana Gempa Bumi Terhadap Kesiapsiagaan Siswa Dalam Menghadapi Gempa Bumi," *J. Ilmu Kesehat.*, vol. 10, no. 1, pp. 1–9, 2019.
- [20] T. Rosdiyani, "Edukasi Kesiapsiagaan Bencana Meningkatkan Pemahaman Prosedur Penyelamatan Diri," *ABDIKARYA J. Pengabd. dan Pemberdaya. Masy.*, vol. 2, no. 1, pp. 1–7, 2020, doi: 10.47080/abdikarya.v2i1.1066.
- [21] W. A. Putranto, Setiyawan, and I. M. Batubara, "Pengaruh Terapi Edukasi Berbasis Keluarga Terhadap Kecemasan Keluarga Dengan Anggota Keluarga Menderita Covid-19," pp. 1–10, 2021, [Online]. Available: <http://eprints.ukh.ac.id/id/eprint/2431/1/NasPub Alfin S17003.pdf>
- [22] D. F. Ramadhan, "Kesiapsiagaan Masyarakat Dalam Menghadapi Bencana Letusan Gunung Gede Di Desa Galudra Kecamatan Cugenang Kabupaten Cianjur," Universitas Islam Negeri Syarif Hidayatullah Jakarta, 2019.
- [23] M. Yuliani and Susilawati, "Optimalisasi Kesehatan Melalui Edukasi Dan Pelayanan Kesehatan Dengan Hipertensi Dan Anemia Dengan Pendekatan Keluarga Binaan," vol. 02, no. 02, pp. 1293–1304, 2022.
- [24] G. Guspianto, M. Mutmainnah, D. Tri Utami, D. Pramudiani, R. A. Nasution, and I. N. Ibnu, "Edukasi Pemberdayaan Keluarga dalam Optimalisasi Fungsi Keluarga di Desa Muara Jambi," *J. Salam Sehat Masy.*, vol. 3, no. 2, pp. 12–18, 2022, doi: 10.22437/jssm.v3i2.17769.
- [25] Siregar, Rahmah. (2022). Factors Which Influence Incident Hypertension on Pre-Elderly. *International Journal of Public Health Excellence (IJPHE)*. 1. 117-121. 10.55299/ijphe.v1i2.66.

- [26] Soviani and M. Rosiska, "Pengaruh Edukasi Berbasis Keluarga Terhadap Diet Penderita Hipertensi Di Wilayah Kerja Puskesmas Sungai Penuh," *J. Nurs. Heal.*, vol. 7, no. 1, 2022.
- [27] V. Giena, S. Wahyuni, Hanifah, and I. Rahmawati, "Pengaruh Media Audio Visual Terhadap Sikap Kesiapsiagaan Masyarakat Pada Bencana Banjir Di Desa Tanjung Kecamatan Hamparan Rawang Provinsi Jambi," *J. Keperawatan Sriwij.*, vol. 9, no. 2, pp. 13–17, 2022.