



Household Knowledge, Attitudes, and Preparedness in Facing Flood Disaster

Alfi Sahrina Sirait¹, Agustina Boru Gultom^{2*}

¹Applied Nursing Undergraduate Study Program, Politeknik Kesehatan Kementerian Kesehatan, Medan, Indonesia

²Nursing Department, Politeknik Kesehatan Kementerian Kesehatan, Medan, Indonesia

Received: 8 April 2026

Revised: 29 April 2026

Accepted: 30 April 2026

Published: 30 April 2026

Corresponding Author:

Author Name:

Agustina Boru Gultom

Email:

aignaagnatom@gmail.com

DOI:

© 2026 The Authors. This open access article is distributed under a (CC-BY License)



Abstract: Floods are a common global disaster, causing significant negative impacts, including economic losses and social impacts, serious health problems, threats to food security, adequate water supply, and biodiversity. Indonesia is one of the Southeast Asian countries most vulnerable to flooding. Household preparedness to anticipate, prepare for and continue to improve after a disaster is an important part of efforts to reduce the impact of disasters. Each family has a choice in responding to the flood disaster that befalls them. This response is largely based on the family's preparedness in facing it. Inappropriate responses can have various impacts, such as various illnesses that arise, property damage, and even death. The main factors that may be related to family preparedness in facing flood disasters need to be studied. The purpose of this study was to determine the relationship between knowledge and attitudes with family preparedness in facing flood disasters in Kampung Baru sub-district, Medan Maimun district, Medan city. This type of research used a quantitative method with a cross-sectional research design, with a purposive sampling technique. The results showed that the p-value of the relationship between knowledge and attitudes with household preparedness in facing flood disasters was 0.0001. It can be concluded that there is a relationship between knowledge and attitudes with household preparedness in facing flood disasters.

Keywords: Knowledge, Attitude, Preparedness, Household, Flood

Introduction

One of the most common disasters worldwide is flooding, which is caused by heavy rainfall. Accounting for approximately forty percent of all disasters. This situation causes significant economic and social losses (Li et al., 2022). From 1990 to the next 32 years, there were approximately 4.700 floods in 168 countries, affecting more than three billion people, causing economic losses exceeding US\$ 1 trillion. The Western Pacific region was the most affected by flooding, with the highest number of death occurring in Southeast Asia, and the highest number of people affected and killed by flooding in Africa and the Eastern Mediterranean (Liu et al., 2024).

Southeast Asia is a region highly vulnerable to natural disasters, both severe and frequent. Flooding is

a particularly pressing issue, as it has serious health impacts (Torti, 2012).

Indonesia, a Southeast Asia country and the fourth most populous in the world, is highly vulnerable to disasters. Floods, landslides, and tornadoes are common annual disasters. One of the causes of disasters in Indonesia is the dangers of climate change, which has led to the severity of flooding. The impacts of these hydrometeorological hazards will increase threats to food security, water supply, human health, biodiversity, and rising sea levels (Fahrudin et al., 2022). It can result in many risks in the community, resulting in social vulnerability at high and low levels (Prabaswara et al., 2023).

The increasing intensity and scope of natural disaster worldwide and Indonesia have resulted in household experiencing various vulnerabilities and facing increased risk in recent years. Households most vulnerable to natural disasters are those in rural areas.

How to Cite:

Sirait, A.S., & Gultom, A.B. (2026). Household Knowledge, Attitudes, and Preparedness in Facing Flood Disaster. *Journal of Disaster Mitigation Research*, 1(1), 1-6.

One study estimated the average total loss from disasters, including medical and burial costs, at approximately USD 2.190 per household. One important factor contributing to mitigating the negative impact of natural disasters is household preparedness (Dartanto, 2022).

Previous studies in Ethiopia showed that household preparedness for flooding was in the low category (Ashenefer et al., 2017). Another past study in Ghana showed that households were predominantly less prepared to deal with flood disaster (Yin et al., 2021). Another previous study in China, also showed that household preparedness in facing emergency event was still low (Chen et al., 2019).

In Indonesia, a total of 3,544 disasters were recorded in 2022, including floods (1,531), extreme weather (1,068), landslides (634), forest and land fires (252), earthquakes (28), extreme waves and abrasion (26), drought (4), and volcanic eruption (1). A total of 6,144,324 people suffered and were displaced, 861 died, 46 were missing, and 8,727 were injured as a result of disasters this year. In addition, infrastructure that was not spared from the impact of the disaster included 95,403 damaged housing units (consisting of 20,205 severely damaged units, 23,213 moderately damaged units, and 51,985 lightly damaged units), 1,983 damaged facilities (consisting of 1,241 educational facilities, 95 health facilities, and 647 places of worship), 163 damaged offices, and 342 damaged bridges (BNPB, 2023). Of the total number of flood disasters, 851 people died, 46 were missing, and 8,726 were injured. Furthermore, 94,990 houses and 1,983 facilities were damaged in the disaster (BNPB, 2022).

North Sumatra Province, one of Indonesia's provinces, has 25 regencies and 8 cities. From 2009 to 2019, disasters in the province included 128 floods, 66 landslides, 3 extreme waves and abrasion, 22 extreme weather events (tornadoes), 8 droughts, 21 forest and land fires, 7 earthquakes, and 28 volcanic eruptions. Flooding in North Sumatra Province from 2009 to 2019 damaged 7191 homes, 824 educational facilities, 3 health facilities, 87 places of worship, and 76 bridges (BNPB, 2021).

Of all the districts and cities in North Sumatra Province, Medan City has the highest number of potential residents exposed to flooding and the number of residents exposed from vulnerable groups, as well as the potential total loss (BNPB, 2021)

The readiness of communities to be able to predict, prepare themselves and continue to recover after a disaster is an important component in efforts to reduce the risk of disasters (Paton, 2019).

Several previous studies have shown that community and household preparedness in Indonesia ranges tend to ready or unready. Studies conducted

during COVID-19 pandemic, using online data collection, showed that community preparedness remained relatively poor (Hargono et al., 2023).

One of the village in Ende Regency, Indonesia, has suffered from flooding for ten years, and the study found that household preparedness in facing floods is still low in relation to meeting children's needs, early warning, emergency response readiness and readiness in mobilizing resources in facing floods (Wawomeo et al., 2022).

Knowledge and attitude are essentials factors that must be considered to maximize preparedness in order to reduce disaster risk (Sujarwo et al., 2018).

Preparedness activities should be based on knowledge so that people have the certainty to be able to prepare themselves well when floods come to face them (Windartik & Ima Rahmawati, 2023). Knowledge regarding disaster preparedness will be in line with a positive attitude in disaster preparedness (Alkalash et al., 2023).

A preliminary survey in December 2023 in Kampung Baru sub-district, Medan Maimun district, Medan city, found 152 floods in the past five years. No casualties were reported, but 275 people suffered from itching. Interviews with 10 families in Kampung Baru sub-district, Medan Maimun district, Medan city, revealed that 7 families had poor flood preparedness.

Based on this background, the problem is how households are prepared for flooding and whether knowledge and attitudes are related to flood preparedness in Kampung Baru sub-district, Medan Maimun district, Medan city.

Method

This research was a quantitative study using descriptive correlation methods. The population comprised 4,003 households in Kampung Baru Village, Medan Maimun District, Medan City. The sample size was calculated using the Slovin formula, with 44 households, representing nine flood-prone hamlets based on the number of households, using a purposive sampling technique. The sample criteria for this study were households residing in flood-prone areas of Kampung Baru Village, permanent residents of the village, and willing to participate. This study used an instrument containing household knowledge, attitudes, and preparedness for flooding. Knowledge consisted of 12 questions, attitudes consisted of 12 statements, and household preparedness for flooding consisted of 12 statements, each of which had been tested for validity and reliability. This study received research permit number 421/845 from the Head of Kampung Baru Village, Medan Maimun District, Medan City, on March 26, 2024. Data analysis used IBM SPSS Stats 11 software, using univariate and bivariate analysis with the chi-

square test. This research has received ethical approval with the number: 01. 25 540/KEPK/Poltekkes Kemenkes Medan 2024. This research has also received permission from the Kampung Baru Village, Medan Maimun District, Medan City with number 421/845 dated March 26, 2024.

Result and Discussion

This research was conducted in Kampung Baru Village, Medan Maimun District, Medan City, from April 1, 2024 to May 31, 2024, involving 44 households. **Table 1** shows the characteristics of the research respondents including gender, age, occupation and last education.

Table 1. Characteristics of Participants

Characteristics	Frequency	(%)
Sex		
Male	10	22,7
Female	34	77,3
Age (Years)		
17-25	3	6,8
26-35	9	20,5
36-45	8	18,2
46-55	18	40,9
56-65	6	13,6
Type of Work		
No Job	13	29,5
Government Employees	12	27,3
Self-employed	12	27,3
Businessman	7	15,9
Last Education		
Senior High School	23	52,3
College	21	47,7

Table 2 shows an overview of family knowledge, attitudes, and preparedness regarding flood disasters.

Table 2. Overview of Family Knowledge, Attitudes and Preparedness Regarding Flood Disasters

Variables	Frequency	Percentage
Knowledge		
Good	27	61,4
Less	17	38,6
Attitude		
Good	14	31,9
Enough	17	38,6
Less	13	29,5
Preparedness		
Good	26	59,1
Less	18	40,9

Table 3 shows the relationship between knowledge and attitudes and family preparedness regarding flood disasters.

Table 3. Relationship Between Knowledge and Attitudes and Household Preparedness Regarding Flood Disaster

Variables	Preparedness				P Value	
	Good		Less		Total	
Knowledge	f	%	f	%	f	%
God	22	50,0	5	11,4	27	61,4
Less	4	9,1	13	29,5	17	38,6
Total	26	59,1	18	40,9	44	100,0
Variables	Preparedness				P Value	
	Good		Less		Total	
Attitudes	f	%	f	%	f	%
Good	9	20,5	5	11,4	14	31,9
Enough	15	34,1	2	4,5	17	38,6
Less	2	4,5	11	25,0	13	29,5
Total	26	59,1	18	40,9	44	100,0

The research results show that respondents were predominantly female. Women have a more serious understanding of disasters events. They concern for their household's well-being and behavior and are more likely to report a willingness to assist in flood disaster situations (Cvetković et al., 2018).

The study results that the majority of household respondents are aged between 46 and 55 years. Previous studies on fire, tsunami, dan earthquake disasters have shown that middle-aged adults are more prepared to participate in disaster management and household preparedness (Cisternas et al., 2024)

The study results show that more household respondents are unemployed. Previous studies have shown that differences in income levels significantly influence household disaster preparedness, higher income levels lead to more effective risk preparedness strategies (Shah et al., 2024).

This study shows that household education in flood preparedness is higher in high school than in college. This contrasts with previous studies in the United States, where the highest level of education for households in disaster preparedness was more often college or higher (Zamboni and Martin, 2020).

From the results of the study, although some households' preparedness in facing flood is lacking, but most are in the good category. A family that is ready to face a flood disaster means that the family has prepared preparedness in the house such as determining the family's roles and tasks, the family's role in securing electricity, storing important documents, preparing a disaster preparedness bag, ensuring the family knows the evacuation route, paying attention to sick and special needs family members, preparing the family for

independent evacuation, and has also prepared preparedness in the environment such as participating in making early flood warnings, checking water drainage, checking and marking places that are potentially dangerous during a flood, integrating our family's emergency plan with neighbors, and participating in training and simulations with family and local residents (BNBP, 2018; BNBP, 2021; Hedriyanti, 2021; Hadi and Cakra, 2017; Akhmadi, 2017). Previous studies also show this, such as a household study in Sendayan showing that although some are still less prepared to face flood disasters, more than 50 percent of households are prepared to face flood disasters (Elfian and Isnaeni, 2022).

This study shows that although some households have insufficient knowledge of flood disaster preparedness, most have good knowledge. Another study also showed that some respondents were in a good category in terms of flood preparedness (Rahmawati and Siti, 2022).

Household attitudes in facing flood disasters show more in the sufficient category compared to good and less. Previous studies also show that the majority of community have sufficient attitudes, although some are good and some are less so (Pandi et al., 2022).

This study shows that the majority of households have good knowledge about flood preparedness, so families are able to prepare for flood disasters, and vice versa. Statistical tests also support this finding, with a p-value of 0.0001, proving a strong correlation between knowledge and household preparedness for flooding. The impact of a disaster can be significantly minimized through disaster preparedness. One of the foundations of disaster preparedness is efforts to increase knowledge by providing and designing knowledge for the community to foster community commitment and participation in greater preparedness (Kusumastuti et al., 2021). Another study, on forest fire disasters, showed a positive correlation between students' knowledge and preparedness in dealing with them (Wulandari et al., 2023). Studies show that households' lack of flood preparedness is due to a lack of knowledge. This situation necessitates managing household knowledge to ensure flood preparedness. Efforts to increase family knowledge in disaster preparedness include providing ongoing education and promotion to the community (Kim and Kim, 2022), disaster management training (Fatmah, 2022), preparedness training is tailored to specific areas and can utilize local wisdom (Subandi et al., 2019). This study shows that the majority of families' attitudes toward flood preparedness are related to household preparedness. This is supported by a p-value of 0.0001, indicating a significant relationship between attitudes and household preparedness for flooding. Household attitudes that are emotional, individualistic

and unwilling to cooperate can lead to decreased preparedness in facing disasters (Babu, 2023). Previous studies have shown a relationship between attitudes and household preparedness in facing flood disasters, but in the category of weak relationships because there is still a lack of proportionality between increases in knowledge and increases in household preparedness in facing flood disasters (Dapun et al., 2024). Attitude can be defined as a person's or group's belief regarding a particular object accompanied by certain feelings as a basis for responding or behaving according to the person's or group own way (Permana, 2023). Community attitudes have a significant impact on disaster preparedness. If a community has experienced flooding in the past, resulting in property damage and loss of life, and believes they can proactively manage flooding, they are more likely to be well prepared. However, if a community has experienced flood damage and believes flooding is unlikely, or develops persistent fear or feelings of helplessness in the face of flooding, they are less likely to take action in flood preparedness (Ao and Martek, 2020). Families' attitudes toward flood preparedness are lacking, and efforts are needed to improve them. This can be done by holding simple meetings that foster positive feelings among each group member. These meetings, conducted in episodes, should generate positive feelings for the group, such as successful cooperation and reduced discrimination among group members (Crano and Prislis, 2011).

The study results show that a small percentage of families' lack of preparedness is poor, but their knowledge and attitudes are good. This suggests that good knowledge and attitudes alone do not necessarily translate into good flood preparedness for all families. Other factors are related to family flood preparedness. Previous studies have shown that many other factors are related to household preparedness in facing disasters, including anxiety, frontline preparedness, and community resilience (Kim and Kim, 2022). However, these factors need to be studied further.

Conclusion

Household knowledge about flood preparedness in Kampung Baru Village, Medan Maimun District, Medan City is included in the good category, although there are still households who have insufficient knowledge of household preparedness. Household attitudes in flood preparedness are predominantly in the sufficient category, although there are still families who have insufficient attitudes in flood preparedness. Meanwhile, household preparedness in flood disasters is included in the good category, although there are still households who have insufficient household preparedness. The results of statistical tests show a

relationship between knowledge and attitudes with household preparedness in facing flood disasters.

Conflicts of Interest

Authors declare no potential conflicts of interest.

References

- Akhmadi Faisal, Kumalawati R., dkk (2017). Pemetaan Jalur Evakuasi dan Pengungsian di Kecamatan Bati-Bati Kabupaten Tanah Laut. *JPG (Jurnal Pendidikan Geografi)*, 4(5).
- Alkalash, S. H., Alhashmi Alamer, E. H., Allihyani, A. M., Alhazmi, A. S., Alharthi, R. M., & Bugis, A. M. (2023). Knowledge of and Attitude Toward Disaster Preparedness Among Secondary School Students in the Western Region of Saudi Arabia. *Cureus*. <https://doi.org/10.7759/cureus.33926>
- Ao, Y. bin, & Martek, I. (2020). *Rural built environment of Sichuan Province, China* (1st ed. 2020). Springer.
- Asheneffe, B., Wubshet, M., & Shimeka, A. (2017). Household flood preparedness and associated factors in the flood-prone community of Dembia district, Amhara National Regional State, northwest Ethiopia. *Risk Management and Healthcare Policy*, Volume 10, 95–106. <https://doi.org/10.2147/RMHP.S127511>
- Babu, S. A. (Ed.). (2023). *5th World Congress on Disaster Management: Volume 2: Nature and human induced disasters*. Routledge. <https://doi.org/10.4324/9781003341932>
- BNPB. (2018). *Data Informasi Bencana Indonesia*. Jakarta: Badan Nasional Penanggulangan Bencana.
- BNPB. (2021). *Kajian Risiko Bencana Nasional Provinsi Sumatera Utara 2022-2026*
- BNPB. (2022). *Data Informasi Bencana Indonesia*. Jakarta: Badan Nasional Penanggulangan Bencana.
- BNPB. (2023). *Indeks Risiko Bencana Indonesia Tahun 2022*.
- Chen, C. Y., Xu, W., Dai, Y., Xu, W., Liu, C., Wu, Q., Gao, L., Kang, Z., Hao, Y., & Ning, N. (2019). Household preparedness for emergency events: A cross-sectional survey on residents in four regions of China. *BMJ Open*, 9(11), e032462. <https://doi.org/10.1136/bmjopen-2019-032462>
- Cisternas, P. C., Cifuentes, L. A., Bronfman, N. C., Repetto, P. B., & Castañeda, J. V. (2024). Household preparedness for multi-natural hazards in coastal communities. *International Journal of Disaster Risk Reduction*, 109, 104584. <https://doi.org/10.1016/j.ijdr.2024.104584>
- Crano, W. D., & Prislun, R. (2011). *Attitudes and Attitude Change* (Online-Ausg). Taylor and Francis.
- Cvetković, V. M., Roder, G., Ócal, A., Tarolli, P., & Dragičević, S. (2018). The Role of Gender in Preparedness and Response Behaviors towards Flood Risk in Serbia. *International Journal of Environmental Research and Public Health*, 15(12), 2761. <https://doi.org/10.3390/ijerph15122761>
- Dapun, E., Saleh, Y., Ghazali, M. K. A., Mahat, H., Hashim, M., Nayan, N., Hayati, R., & Kurnia, R. (2024). Knowledge, attitude and community preparedness in facing flood disasters. 020012. <https://doi.org/10.1063/5.0183029>
- Dartanto, T. (2022). Natural disasters, mitigation and household welfare in Indonesia: Evidence from a large-scale longitudinal survey. *Cogent Economics & Finance*, 10(1), 2037250. <https://doi.org/10.1080/23322039.2022.2037250>
- Elfian dan Isnaeni L.M.A (2022). Hubungan Pengetahuan Kepala Keluarga Dengan Kesiapsiagaan Rumah Tangga Dalam Menghadapi Banjir Di Desa Sendayan. *Jurnal Kesehatan Tambusai*, 1(1).
- Fahrudin, A., Patrianti, T., & Yusuf, H. (2022). Climate Change, Disaster, and Social Work in Indonesia. In R. Baikady, S. M. Sajid, J. Przeperski, V. Nadesan, M. R. Islam, & J. Gao (Eds.), *The Palgrave Handbook of Global Social Problems* (pp. 1–14). Springer International Publishing. https://doi.org/10.1007/978-3-030-68127-2_77-1
- Fatmah, F. (2022). Effect of disaster training on knowledge regarding flood risk management amongst families with older people. *Jambá: Journal of Disaster Risk Studies*, 14(1). <https://doi.org/10.4102/jamba.v14i1.1262>
- Hargono, A., Artanti, K. D., Astutik, E., Widodo, P. P., Trisnawati, A. N., Kusuma Wardani, D., & Lioni, E. (2023). Relationship between disaster awareness and disaster preparedness: Online survey of the community in Indonesia. *Journal of Public Health in Africa*, 14(9), 8. <https://doi.org/10.4081/jphia.2023.2376>
- Hedriyanti dan Syamsuddin (2021). Peran Perempuan Terhadap Penanggulangan Bencana di Dinas Sosial Provinsi Sulawesi Selatan. *Jurnal Mimbar Kesejahteraan Sosial*, 4(2).
- Kim, Y., & Kim, M. Y. (2022). Factors affecting household disaster preparedness in South Korea. *PLOS ONE*, 17(10), e0275540. <https://doi.org/10.1371/journal.pone.0275540>
- Kusumastuti, R. D., Arviansyah, A., Nurmala, N., & Wibowo, S. S. (2021). Knowledge management and natural disaster preparedness: A systematic literature review and a case study of East Lombok, Indonesia. *International Journal of Disaster Risk Reduction*, 58, 102223. <https://doi.org/10.1016/j.ijdr.2021.102223>
- Li, C., Sun, N., Lu, Y., Guo, B., Wang, Y., Sun, X., & Yao, Y. (2022). Review on Urban Flood Risk Assessment. *Sustainability*, 15(1), 765. <https://doi.org/10.3390/su15010765>
- Liu, Q., Du, M., Wang, Y., Deng, J., Yan, W., Qin, C., Liu, M., & Liu, J. (2024). Global, regional and national trends and impacts of natural floods, 1990–2022. *Bulletin of the World Health Organization*, 102(06), 410–420. <https://doi.org/10.2471/BLT.23.290243>
- Pandi, L.A., Saktiawan, Y., Sari, D. (2022). Pengetahuan Dan Sikap Masyarakat Dalam Kesiapsiagaan Bencana Banjir Bandang. *Media Husada Journal Of Environmental Health*. 2(2).
- Paton, D. (2019). Disaster risk reduction: Psychological perspectives on preparedness. *Australian Journal of Psychology*, 71(4), 327–341. <https://doi.org/10.1111/ajpy.12237>
- Permana, I. (with Rochmawati, E.). (2023). Proceedings of the International Conference on Sustainable Innovation on Health Sciences and Nursing (ICOSI-HSN 2022). Atlantis Press (Zeger Karssen).

- Prabaswara, S. A., Wijaya, Y. T., & Miranda, S. (2023). An analysis of social vulnerability clustering to natural disasters (case studies in all districts/cities in Indonesia in 2019). 020003. <https://doi.org/10.1063/5.0164476>
- Rahmawati, D., Siti, F., (2022). Hubungan Pengetahuan Dengan Sikap Kesiapsiagaan Bencana Banjir di Desa Koripan Kecamatan Polanharjo Kabupaten Klaten. *SEHATMAS (Jurnal Ilmiah Kesehatan Masyarakat)*. 1(4).
- Shah, A. A., Ullah, W., Khan, N. A., Alotaibi, B. A., & Xu, C. (2024). Mapping Rural Household Vulnerability to Flood-Induced Health Risks in Disaster-Stricken Khyber Pakhtunkhwa, Pakistan. *Sustainability*, 16(23), 10578. <https://doi.org/10.3390/su162310578>
- Subandi, A., Alim, S., Haryanti, F., & Prabandari, Y. S. (2019). Training on modified model of programme for enhancement of emergency response flood preparedness based on the local wisdom of Jambi community. *Jambá Journal of Disaster Risk Studies*, 11(1). <https://doi.org/10.4102/jamba.v11i1.801>
- Sujarwo, Noorhamdani, & Fathoni, M. (2018). Disaster Risk Reduction in Schools: The Relationship of Knowledge and Attitudes Towards Preparedness from Elementary School Students in School-Based Disaster Preparedness in the Mentawai Islands, Indonesia. *Prehospital and Disaster Medicine*, 33(6), 581–586. <https://doi.org/10.1017/S1049023X18000778>
- Torti, J. (2012). Floods in Southeast Asia: A health priority. *Journal of Global Health*, 2(2). <https://doi.org/10.7189/jogh.02.020304>
- Utomo Hadi dan Buana Faizal Cakra (2017). *Pedoman Standar Layanan Kesiapan Keluarga Hadapi Bencana*. Deputi Bidang Perlindungan Anak Jakarta: Kementerian Pemberdayaan Perempuan dan Perlindungan Anak.
- Wawomeo, A., Cahyani, S. L., Sekunda, M., Bedho, M., & Doondori, A. K. (2022). Family preparedness of children in dealing with a flood disaster in Paupanda II Village, Wewaria sub-district of Ende Regency Indonesia. *International Journal of Health Sciences*, 8000–8009. <https://doi.org/10.53730/ijhs.v6nS4.10394>
- Windartik, E. & Ima Rahmawati. (2023). Knowledge with Flood Disaster Preparedness in Mojokerto District. *Journal of Scientific Research, Education, and Technology (JSRET)*, 2(2), 787–795. <https://doi.org/10.58526/jsret.v2i2.158>
- Wulandari, F., Budijanto, B., Bachri, S., & Utomo, D. H. (2023). The relationship between knowledge and disaster preparedness of undergraduates responding to forest fires. *Jambá: Journal of Disaster Risk Studies*, 15(1). <https://doi.org/10.4102/jamba.v15i1.1408>
- Yin, Q., Ntim-Amo, G., Ran, R., Xu, D., Ansah, S., Hu, J., & Tang, H. (2021). Flood Disaster Risk Perception and Urban Households' Flood Disaster Preparedness: The Case of Accra Metropolis in Ghana. *Water*, 13(17), 2328. <https://doi.org/10.3390/w13172328>
- Zamboni, L. M., & Martin, E. G. (2020). Association of US Households' Disaster Preparedness With Socioeconomic Characteristics, Composition, and Region. *JAMA Network Open*, 3(4), e206881. <https://doi.org/10.1001/jamanetworkopen.2020.6881>