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Research Article

Evaluation of the Knowledge and Preparedness Level of Disaster Response Pharmacists Regarding Disaster Management

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Abstract: Indonesia is an archipelagic country flanked by two continents and two oceans, and is located on the equator which causes Indonesia to have a very high potential for disasters. Pharmacists have a role in disaster management in handling pre, during and post disasters. The aim of this research was to deter-mine the level of knowledge of disaster response pharmacists (ATB) regarding disaster management. This research is a descriptive research with total sampling method. Data collection techniques using a questionnaire. The questionnaire was filled in directly by disaster response pharmacists who were willing to participate. Based on the results of research on pre-disaster pharmacist preparation results, the knowledge level was obtained with a percentage of 88% and included in the good category. For the willingness and readiness of pharmacists during a disaster, the percentage was 97.5%, included in the level of knowledge in the good category, when a disaster occurred, the percentage was 97. 6% was in-cluded in the level of good knowledge category. Based on the results, it can be concluded that the knowledge level of disaster response pharmacist members about disaster management is 95.8% and is categorized as good.

Keywords: Disaster Management; Disaster Response; Knowledge Level; Pharmacists; Pre-disaster Preparation.

1. Introduction

Indonesia is an archipelagic nation consisting of approximately 17,000 islands, sandwiched between two continents and two oceans: Asia and Australia, and the Pacific and Indian Oceans. With a population of 258.7 million, Indonesia is the fourth most populous country in the world. Located on the Ring of Fire, Indonesia is prone to nu-merous natural disasters, such as earthquakes, floods, landslides, volcanic eruptions, and tsunamis (Martin, 2018).

Preparedness for a health crisis during a disaster is crucial. One way to prevent a health crisis is to educate the public about disaster preparedness and the importance of self-medication. In the pharmaceutical sector, pharmacists and pharmaceutical technicians in particular play a crucial role in disaster response. One of the roles of pharmacists before a disaster is to project the most common diseases during the disaster, prepare appropriate medications for those diseases, and provide backup stocks at every nearby health facility in the disaster area (Bell and Daniel, 2014).

One of the specialized teams currently in place is the Disaster Response Pharmacist (ATB). One of the ATB's crucial roles in disaster situations is managing all incoming logistical aid, particularly medicines and consumable medical supplies, which are delivered in significant quantities. This logistics does not automatically help the community or affected victims, as it must be delivered according to need. Because the vast amount of medicine is packaged with other logistics, its utilization and use require trained volunteers with specialized skills, such as pharmacists. Therefore, if not used properly, it will not benefit but

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instead cause danger and unwanted effects. Currently, there are still few pharmacists actively playing a role in disaster situations (Indonesian Pharmacists Association).

According to research conducted by Firmansyah et al. (2014), it was found that knowledge and behavior regarding preparedness for floods and landslides have a positive correlation. The higher the level of knowledge, the higher the level of preparedness. An-other study conducted by Fakhrurrazi et al. (2015) in Pidie Jaya Aceh, specifically on health workers, showed different findings. In this study, it was found that 60% of health workers had good knowledge about disasters, and 56.7% showed a good attitude towards floods. However, in terms of preparedness, 53.3% of respondents were not ready to face disaster risks.

Based on research conducted by Ahayalimudin et al. (2012), it was found that health workers, especially nurses, did not have adequate knowledge. However, so far there has been no research exploring the knowledge of pharmaceutical workers in disaster man-agement.

Based on research conducted by Yulia Citra, et al (2021), it was found that pharma-ceutical personnel's knowledge about disasters, their role in disaster management, and their knowledge about the availability of medicines in disaster management is still limited. Therefore, cooperation between pharmaceutical personnel is also needed to create optimal health services during disasters.

Based on research conducted by Lina Dwi Setiyarini (2020) on pharmacists' knowledge and role in disaster management, it was found that pharmacists in Surabaya City have good knowledge on this matter.These results indicate that most pharmacists have a sufficient understanding of their role during disasters. However, the study also shows that pharmacist participation is still low, especially in training activities or seminars on disaster management. Therefore, it is recommended that pharmacists and pharmaceutical technical personnel (TTK) participate in training to improve their knowledge and skills in disaster management.

2. Preliminaries or Related Work or Literature Review

A disaster can be defined as an event that poses a threat and disrupts people's lives, whether caused by natural or non-natural factors, and may involve human factors. Disasters have the potential to cause loss of life, environmental damage, material losses, and significant psychological impacts. Disaster emergency response is an immediate effort undertaken when a disaster occurs, with the aim of reducing its negative impact. These activities include rescuing and assessing victims, protecting property, meeting basic needs, managing refu-gees, and restoring affected facilities and infrastructure (Rita K, Beong.S, Erwin.R., 2018). Disaster management can be defined as a series of actions or activities carried out to prevent, reduce the impact, improve preparedness, provide an appropriate response, and restore conditions after a disaster. These efforts are carried out at various stages, namely before a disaster occurs, during a disaster, and after a disaster occurs (Fradilla, 2018).

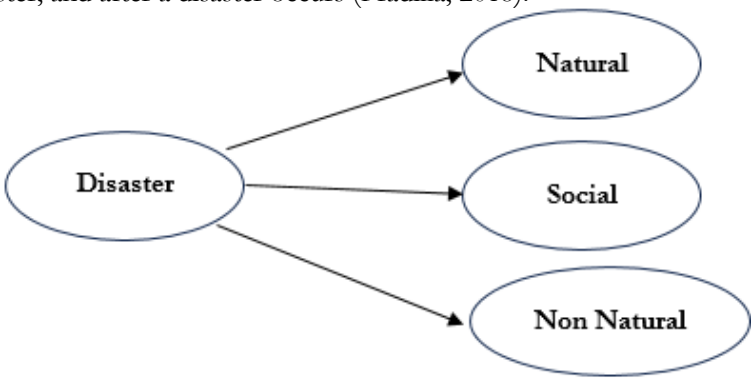

Figure 1. Types of Disaster.

According to records from the National Disaster Management Agency (BNPB) in Indonesia, there were 3,622 disasters between January 2019 and December 16, 2019. This data shows an increase in the number of disasters compared to previous years. During the 2009-2019 period, there was an increase in the number of disasters such as floods and tornadoes every year. In 2019, BNPB noted that Central Java province experienced the highest number of disasters, with 859 incidents. West Java ranked second with 672 inci-dents, followed by East Java with 582 incidents in third place. Aceh recorded 117 disaster incidents, while South Sulawesi recorded 162 incidents. (BNPB 2019).

Preparedness is one of the important steps in disaster management. It is an effort that must be carried out by various parties, including the government, the private sector, and the

community. This preparedness is implemented through the creation of regulations, pro-gram planning, fund allocation, development, and the establishment of relationships be-tween institutions or organizations responsible for disaster preparedness (Ristrini et al. 2012).

The Role of Disaster Response Pharmacists in Disaster Management

Disaster response pharmacists are part of an association that is directly integrated with the Indonesian Pharmacists Association (IAI).Pharmacists are health professionals who are responsible for providing pharmaceutical services, both in normal conditions and in disaster situations. In disaster management, they play an important role and must be actively involved in disaster management related to medicines and medical supplies. This involves their ability to make assertive contributions and carry out their responsibilities related to disaster management in terms of medicines and medical supplies (Pincock et al., 2011).

One of the preparatory efforts undertaken by disaster response pharmacist organizations is to initiate collaboration with the government and other health professional organizations, as well as to develop internal policies related to disaster management at the national and regional/local levels. The following are some of the policies implemented by professional organizations (FIP, 2006; Bell & Daniel, 2014):

a. a.Providing disaster response training for pharmaceutical personnel in both logistics management and service delivery
b. b.Reviewing existing disaster management plans
c. c.Becoming the main source of information before and during the disaster response phase.
d. d.Coordinating with the Health Office at the provincial or district/city level and the National Disaster Management Agency (BNPB) or Regional Disaster Management Agency is a step taken in sending pharmaceutical personnel (pharmacists or pharmaceutical technical personnel) to disaster-affected areas.
e. e.Designing the flow of information on drug needs in disaster-affected areas
f. f.Collaborating with the pharmaceutical industry and distributors of drugs and medical devices for the ordering/distribution of drugs specifically intended for disaster-affected areas.
g. g.Participating in the development of disaster management plans at the national, regional, or local levels.

In disaster management in Indonesia today, the role of professional pharmaceutical organizations is still limited. This assessment is based on the author's observations in the field and analysis of various news sources. Currently, the role of professional pharmaceutical organizations in disaster situations mainly focuses on collecting medicines and medical supplies and distributing them to disaster-affected areas. However, there are no standard operating procedures in place for disaster response and management by professional organizations. In addition, there is no clear coordination channel for pharmacists and pharmaceutical technicians established by relevant professional organizations.

From their competencies and skills, pharmaceutical personnel (pharmacists and pharmaceutical technicians) have two crucial roles in disaster response situations. First, they are responsible for organizing and distributing necessary medicines and medical equipment. Second, they also play a role in managing patient therapy during a disaster. The expertise and knowledge of pharmaceutical personnel must be involved in pre-disaster preparedness

Knowledge of Drug Availability Management and Medical Supplies Used in Disaster Management.

Medicines and medical supplies that must be prepared

The main indicator of successful health services is the availability of medicines needed by the community in health care facilities, which means that there are no shortages or stockouts of medicines. When there are shortages of medicines, this can hinder the process of providing health services to the community. According to Minister of Health Decree No. 59 of 2011, it is recommended that a buffer stock of medicines and medical supplies be available in disaster situations at the district/city, provincial, and central levels. There are also guidelines for the list of medicines that must be provided according to the type of disaster that occurs. Factors that are taken into consideration in the provision of medicines and medical supplies are the type of disaster, the extent of the disaster, the number of victims, and the available stock of medicines. With this approach, it is hoped that the needs in the field can be met (Kepmenkes, 2011).

Distribution and storage of medicines

When a disaster occurs, medicines are distributed to the disaster site by pharmaceutical personnel assisted by other health workers. In accordance with Minister of Health Decree

No. 59 of 2011, the stages of distributing medicines and medical supplies during a disaster are as follows: health posts directly request medicines from the nearest community health center, and the available medicines are immediately used to treat disaster victims. If there is a shortage of the required medicines, the District/City Pharmacy Installation must replenish the supply of those medicines.

The storage of medicines and pharmaceutical supplies during a disaster is carried out in the same way as the storage of supplies under normal conditions, as there are no special supplies of medicines and medical supplies for disasters. At the disaster site, medicines and medical supplies must be stored in a place that meets the requirements and managed by competent personnel so that the quality of medicines and medical supplies is maintained (Kepmenkes, 2011).

3. Materials and Method

This research is quantitative with a descriptive design. Data collection was conducted by distributing questionnaires to respondents who had agreed to provide informed con-sent. The study was conducted using a Google Form and completed by all disaster re-sponse pharmacists in Makassar, South Sulawesi, from January to March 2025. In this study, the research population was all pharmacists involved in the Disaster Response Pharmacists (ATB) organization in Makassar City, South Sulawesi.The number of re-spondents in this study was 100 respondents who met the inclusion and exclusion criteria. The inclusion criteria for this study were:Able to communicate well, including members of the disaster response pharmacist organization, willing to participate in the research, while the exclusion criteria were incomplete questionnaire completion, not being a member of the disaster response pharmacist, unable to communicate well.

Algorithm/Pseudocode

The sample in this study consisted of members of the Disaster Response Pharmacists (ATB) using simple random sampling technique, whereby each member of the population had an equal chance of being selected as a sample. The sample size was calculated using the Slovin formula (Tiurmauli, 2018).

Explanation:

n: sample size / number of respondents

N: population size

e: error tolerance of 10%

Data collection was carried out by sharing a questionnaire link which was filled out directly by respondents, namely Makassar City Disaster Response Pharmacists (ATB). The collected data was inputted into Microsoft Excel and processed, then analyzed based on percentages. The data were presented in tabular form. For the questionnaire assessment, correct answers were given a score of 1 and incorrect answers were given a score of 0. The percentage of knowledge level of disaster response pharmacist members used the formula: (achieved score/maximum score) x 100%. The level of knowledge in this study was cat-egorized into three categories:Good 76-100%, Sufficient 56-75%, Poor <56% (Larasari, 2015).

Data analysis is processed descriptively using a Likert scale. Scoring is the assignment of numbers and answers to questions to obtain quantitative data, and assigning values based on the answers obtained from respondents.Tabulating is the collection of data that has been correctly filled in by respondents, then calculated and summed up and prepared in tabular form with the score calculation formula as shown in the following formula:

Score = (score achieved) / (maximum score) x 100%

The level of knowledge is categorized into 3 categories, namely (Larasari, 2015):

Good: 76-100%

Fair: 56-75%

Poor: <56%

4. Results and Discussion

This study was conducted on respondents from the Disaster Response Pharmacists (ATB) group in Makassar City, South Sulawesi Province. A total of 100 respondents were recruited from a total study population of 140. Respondents who signed informed consent then completed a questionnaire.

Figures and Tables

Characteristics of Research Respondents

The characteristics of respondents involved in this study include age, gender, and highest level of education. The percentage of respondent characteristics can be seen in the following table:

Table 1. Respondent Characteristics Data.

Respondent Characteristics	Amount (n)	Percentage (%)
Gender		
Man	43	43
Woman	57	57
Age		
24-30 years	51	51
31-40 years	40	40
41-55 years	9	9
Total	100	100

Based on the table above, the description of the characteristics of respondents based on gender shows that the majority of respondents in this study were female, namely 57 people (57%) and the number of male respondents was 43 people (43%).

Description of respondent characteristics based on age showed that the majority of respondents were 24-30 years old with a total of 51 people (51%), while respondents aged 31-40 years were 40 people (40%), and respondents aged 41-55 years were 9 people (9%).

Level of knowledge of disaster response pharmacist members regarding disaster management

Table 2. Level of knowledge of disaster response pharmacist members regarding disaster management.

No	Knowledge Level of Disaster Response Pharmacists	Score	Percentage (%)	Category
1.	Pre-disaster pharmacist preparation	352	88	Good
2.	Pharmacist readiness and preparedness during disasters	780	97.5	Good
3.	Level of knowledge of pharmacists during disasters	879	97.6	Good
	Score	2.011	95.8	Good

Based on table 4.2, it shows that the level of knowledge regarding pre-disaster pharmacist preparation has a score of 352 (88%) and is included in the good knowledge category. Then the level of knowledge regarding the willingness and readiness of pharmacists during a disaster has a score of 780 (97.5%) which is classified as a good level of knowledge, while the level of knowledge of pharmacists during a disaster has the highest score of 879 (97.6%) and is included in the good level of knowledge category. The total score of the overall category in this study is 2,011 (95.8%), so overall it can be concluded that the level of knowledge of disaster response pharmacist members about disaster management is included in the good level of knowledge category

5. Discussion

The results of a study on the level of knowledge of disaster response pharmacists regarding disaster management showed that 100 respondents were in the good category. This is consistent with research conducted by (Lina Dwi Setiyarini et al. 2020) where in their research it was shown that the level of respondents' knowledge was included in the good category with a percentage of (92.5%).

In the study, several factors can influence a person's level of knowledge, such as age, gender, occupation, education, and information (Sari et al., 2021). Judging from the description of gender characteristics, it was found that the majority of respondents in this study were female, with a total of 57 respondents (57%). This is in accordance with the theory that women tend to have a greater sense of curiosity when compared to men, this is because women are more concerned about health, such as medicines (Rikomah 2020).

Based on age characteristics, the results obtained show that the respondents in this study have an adult age range of 19-30 years, namely 51 respondents (51%), this is in accordance with the theory which states that age influences the way a person views and thinks as a person develops, this influences a person's level of knowledge (Hasyifah, 2021).

Based on the characteristics of the most recent education obtained results that the majority of respondents in this study were pharmacists, as many as 48 respondents (48%). This is in accordance with the theory that education will influence a person's learning process where the higher a person's education, the easier it is for someone to receive information and the more rational in choosing drugs (Fuaddah 2015).

Disaster response pharmacists' knowledge of pre-disaster preparation was good, with a score of 352 (88%). This indicates that most disaster response pharmacists were well prepared before a disaster. This is consistent with research findings that found pre-disaster pharmacists' knowledge was considered good (Lina Dewi Setiyarini et al., 2021).

Based on the results of the questionnaire data used to see the level of knowledge of members of disaster response pharmacists, from 100 respondents showed that 96 people (96%) members of disaster response pharmacists had attended training related to disaster management, this is in accordance with the theory that states that the contribution of pharmacists during a disaster is not only equipped with knowledge but also emergency response, first aid, drug management, building tents, evacuation, even experience in dealing with problems at the disaster site (Indonesian Pharmacists Association). There are 79 people (79%) who have made plans regarding the design of drug information flow at the disaster site, this is in accordance with the theory that states that drugs and health supplies in disaster locations must be provided and distributed according to the needs of disaster victims. This can be seen from the type of disaster that occurred, the number of refugees or disaster victims, and age (Meutia Faradilla, 2018).

A total of 98 people (98%)Disaster response pharmacist members stated that the National Disaster Management Agency is responsible for reviewing disaster management plans related to diseases and the necessary drugs, this is in accordance with the theory that states that the National Disaster Management Agency is responsible for providing guidelines and direction for disaster management efforts which include disaster prevention, handling emergencies such as preparing evacuation facilities, preparing medicines for disaster victims and rehabilitation.

There are 79 people (79%) who are members of the disaster response pharmacistsThey have prepared specific medications for chronic diseases during a disaster. This is in accordance with the theory that pharmacists or pharmaceutical personnel at disaster sites are required to prepare medications and medical supplies as needed, especially specific medications, to avoid unwanted incidents (Iin Ernawati, 2022). Based on the data obtained, it can be said that members of the disaster response pharmacists already know and understand their role during the pre-disaster period.

The level of knowledge of pharmacists who are responsive to disasters regarding the availability and readiness of pharmacists during disasters has a good knowledge level category with a score of 780 (97.5%). This is in line with the results of a study stating that pharmacists are ready and available during disasters (Lina Dwi Setiyarini, et al. 2020).

Based on the questionnaire data, it was found that 98 pharmacists (98%) were ready to be at evacua-tion sites during disasters. This is in line with the theory that refugee groups need special attention, especially in terms of medical treatment and counseling, because they have lost some of their basic rights against their will, which can threaten the lives of refugees (Hafni Handayani, 2020).

A total of 92 people (92%) of disaster response pharmacists were involved in efforts to prevent infec-tious diseases. This is in line with the theory that pharmacists and other health workers work together to pro-vide special attention to disaster victims to prevent infectious diseases (Hafni Andayani, 2020).

A total of 95 people (95%) of disaster response pharmacists must continue to provide counseling for disaster victims. This is in line with the theory that counseling services for disaster victims must continue to be provided with the aim of counseling victims who experience crisis, trauma, and acute psychological dis-orders due to disasters, and to assist in mental recovery (Indonesian Counselors Association (IKI), 2017).

There were 97 people (97%) of disaster response pharmacists who conducted a survey to map diseas-es in disaster locations. This is in line with the theory that pharmacists also play a role in mapping diseases suffered by victims so that the spread of disease during disasters can be minimized (Elida Zairina, 2020).

There were 100 (100%) disaster response pharmacists who collaborated with pharmacies and the government to prepare and calculate the medicines and medical equipment needed during disaster situations. This is in line with the theory that pharmaceutical distributors can

work with the government to prepare the medicines and medical supplies needed to treat disaster victims (Bell et al., 2014).

There were 98 people (98%) of disaster-responsive pharmacists who stated that pharmacies need to distribute medicines for disasters. This is in line with the theory that states that pharmacists in hospital phar-macy installations (IFRS), community pharmacies, and pharmaceutical distributors can take an active role in providing medicines and health supplies at disaster sites (Noe & Smith, 2013). Based on the above data, it can be said that disaster response pharmacists are willing and ready when a disaster occurs.

The level of knowledge of disaster response pharmacists when a disaster occurs is categorized as good, with a score of 879 (97.6%). This is in line with research findings that pharmacists have good knowledge when a disaster occurs (Lina Dwi Setiyarini, 2020).

Based on the results of the questionnaire, it was found that 92 people (92%) of disaster-response pharmacists can ensure the safety and security of other pharmacy staff during a disaster. This is in line with the theory that pharmacists build a security system to ensure the safety of pharmacy staff during a disaster (Agustiawan 2018).

There are 99 people (99%) of pharmacists who can manage and ensure the stock of medicines in pharmacies for disaster preparedness. This is in line with the theory that states that the supply of medicines in pharmacies is very important because the impact of problems with medicine stocks is a delay in health care. If medicine stocks run out, it is necessary to wait for a shipment of medicines from the center, and the dos-age of medicines will not be in accordance with treatment requirements, raising concerns that the treatment of victims will be hampered (Hery Dwi Yanto, 2018).

A total of 100 people (100%) of disaster-responsive pharmacists can provide the medicines needed during a disaster. This is in line with the theory that an organization must have a supply of medicines to meet needs during a disaster because if the required medicines run out, it can hinder the rescue and recovery of victims.

A total of 98 people (98%) of disaster response pharmacists provided counseling to disaster victims. This is in line with the theory that counseling disaster victims is very important in order to reduce trauma, fear, and stress in disaster victims (Nur'aini Safitri, 2018). There were 99 people (99%) of disaster response pharmacists who were able to anticipate changes in disease. This is in accordance with BNPB Regulation Number 7 of 2008 concerning the identification of vulnerable groups in disaster situations, such as mapping vulnerable groups and health problems and disease risks due to disasters.

There were 100 people (100%) of disaster response pharmacists who ensured the safety and proper storage of medicines at the medicine distribution center. This is in accordance with the theory that medi-cines at disaster sites should be packaged in containers that are protected from danger with clear and easy-to-understand labels. It is also important to note how the available medicine stock is organized and prepared (ASHP, 2003).

There are 100% of disaster-responsive pharmacists who provide various medicines and medical equipment at various stages of disaster management. This is in accordance with the Minister of Health's regulation on the management of medicines and medical equipment that must be available at disaster sites. The medicines provided follow the trends of diseases that often arise at disaster sites (Ministry of Health 2011).

There are 94 (94%) disaster response pharmacists who ensure that patients who come to their prac-tice are not infected with diseases that exist during a disaster. This is in accordance with the theory that pharmacists and pharmaceutical personnel play a role in providing education on disease prevention and de-tection so that the number of victims infected with diseases can be minimized (International Pharmaceutical Organization (FIP), 2006).

There were 97 people (97%) of disaster response pharmacists who established procedures to ensure that activities at the pharmacy continued even if a disaster occurred in the surrounding area. This is in line with the theory that in disaster situations, pharmacists and pharmaceutical personnel must establish proce-dures to ensure that activities at the pharmacy or pharmaceutical facility continue (FIP, 2006). Based on the above data, it can be said that members of the disaster response pharmacists have a good level of knowledge when a disaster occurs.

6. Conclusion

Based on the results of this study, it can be concluded that the level of knowledge of disaster response pharmacist members regarding disaster management is categorized as good, at 95.8%. Pharmacist members who are members of the disaster response pharmacist organization should further enhance their disaster response training before going to disaster locations to gain an overview of the disaster area.

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References

Agustiawan, A. (2018). *Security and disaster mitigation systems*; Yogyakarta.

Bell, C., & Daniel, S. (2014). Director's forum: Pharmacy leader's role. *HPJ, 49*(4), 398-404. https://doi.org/10.1310/hpj4904-398

Decree of the Minister of Health. (2011). Guidelines for managing medicines and health supplies in disaster management. Jakarta.

Faradilla, M. (2018). The role of pharmacists in disaster management.

FIP Statement of Professional Standards. (2006). The role of the pharmacist in crisis management: Including manmade and natural disasters and pandemics. Retrieved from https://www.fip.org/www/uploads/database_file.php?id=275&table_id=

Fuaddah, A. T. (2015). Description of self-medication behavior in the community of Subdistrict Purbalingga, District Purbalingga. *Journal of Public Health (Undip), 3*(1), 610-618.

Hafni Andayani. (2020). Health service management for post-disaster refugees.

Hasyifah, N. (2021). Overview of public perceptions of COVID-19 vaccination in Rappocini District, Makassar City in 2021.

Indonesian Counselors Association (IKI). (2017). Report on trauma counseling for earthquake victims in Pidie Jaya, Aceh: Collaboration between the Indonesian Counselors Association and Padang State University. Padang: IKI.

Lai, E., Le Trac, & Lovett, A. (2013). Expanding the pharmacist's role in public health. *Universal Journal of Public Health, 1*(3), 79-85. https://doi.org/10.13189/ujph.2013.010306

Larasari, P. (2015). The effect of counseling with the assistance of leaflet media on antibiotic use in the Patrang community, Jember Regency. *Thesis, Department of Pharmacy, University of Jember*.

Martin, J. D. (2018). *Indonesia disaster management reference handbook*. US: The Center for Excellence in Disaster Management and Humanitarian Assistance, 12-16.

Noe, B., & Smith, A. (2013). Development of a community pharmacy disaster preparedness manual. *J.Am Pharm Assoc., 53*, 432-437. https://doi.org/10.1331/JAPhA.2013.12115

Rikomah, S. E. (2020). Level of public knowledge about Dagusibu medicine in Tanah Patah Village, Bengkulu City. *Indonesian Journal of Pharmaceutical Research, 9*(2), 51-55. https://doi.org/10.51887/jpfi.v9i2.851

Setiyarini, L. D., et al. (2020). Knowledge and role of pharmacists regarding disaster management. *Community Pharmacy Journal, 6*(1), 30-37.