
The Importance of Pharmacist's Role in Disaster Management in Indonesia

Yuna Fajar Herdiansyah¹, Andi Mar'ie Ramadan Nurussalam², An Nisa Nur Laila³

Abstract

Indonesia is the meeting place of three tectonic plates in the world that make Indonesia one of the highest disaster frequency countries in the world. Based on the Indonesian Disaster Information Data (DIBI) from 2005 until 2015, more than 1,800 disaster events hit various regions in Indonesia. There always be huge effects after disaster, including a health crisis. To fulfil the community needs related to health, a system is needed to deal with the disasters' effects. This research intended to know about the importance of pharmacist's role in disaster management. The method used in this research is literature review to know about the pharmacist role in disaster management in Indonesia and other country. We compared the role that has been carried out with the guidelines made by government when the disaster occurred. We used the guidelines from Indonesia and America. The result is the role of pharmacists in Indonesia still lack in handling disasters. For this reason, it is necessary to improve the performance of pharmacists in handling disasters. We proposed several suggestion in three level disaster (pre-disaster, during disaster, and post disaster) based from what pharmacist did in other country but still not implemented in Indonesia.

Keywords

Disaster, disaster management, health care, role of pharmacist.

1. Introduction

INDONESIA is the meeting place of three tectonic plates, called the Indo-Australian plate, the Eurasian plate, and the Pacific plate. As a result of the tectonic activities, Indonesia has a series of volcanoes as part of volcanoes throughout the Asia-Pacific region called the ring fire ring [1]. These factors make Indonesia one of the highest disaster frequency countries in the world [2].

Based on the Indonesian Disaster Information Data (DIBI) - National Disaster Management Agency (BNPB), from 2005 until 2015, more than 1,800 disaster events hit various regions in Indonesia. More than 78% (11,648) of disaster events are hydro meteorological disasters, including floods, extreme waves, extreme weather, land and forest fires, and droughts. Meanwhile, around 22% (3,810) of disaster events are geological disasters, including tsunami, earthquakes, landslides and volcanic eruptions. Even though the number of geological disasters is smaller than the hydro meteorological disaster, but in reality many geological disasters have considerable loss from the victim's side and the economic conditions of the affected area [1].

In 2018, various types of disasters hit Indonesia. There were 1,999 disasters (as of October 25, 2018) which included tsunami, destructive earthquakes, floods, landslides,

Corresponding Author: Yuna Fajar Herdiansyah (yuna.fajar.herdiansyah-2015@ff.unair.ac.id)

1 Yuna Fajar Herdiansyah, Universitas Airlangga, yuna.fajar.herdiansyah-2015@ff.unair.ac.id

2 Andi Mar'ie Ramadan Nurussalam, Universitas Airlangga, andi.marie.ramadan-2015@ff.unair.ac.id

3 An Nisa Nur Laila, Universitas Airlangga, an.nisa.nur-2015@ff.unair.ac.id

tornadoes, forest and land fires, and tidal and abrasion waves. The number is predicted increase until the end of 2018. The impact is very large, 3,548 people died and lost, 13,112 people were injured, 3.06 million people were displaced and affected by the disaster, 339,969 houses were severely damaged, 7,810 houses moderately damaged, 20,608 houses were slightly damaged, and thousands of public facilities were damaged. Based on these data, the impact caused by the disaster in 2018 was considered the highest since 2007[3].

Some of the biggest disasters that contributed to the impact in 2018 is earthquakes in Lombok and Sumbawa on July 29th 2018, August 5th 2018, and August 19th 2018, as well as earthquakes and tsunami that occurred in Central Sulawesi on September 28th 2018. Earthquakes that occurred in Lombok and Sumbawa caused 564 deaths and 445,343 people were displaced. Whereas the earthquake and tsunami that occurred in Central Sulawesi caused 2,081 people to die, 1,309 people missing and 206,219 people displaced[3].

There always be a huge effects after disaster, including a health crisis. To fulfil the community needs related to health, a system is needed to deal with the disasters' effects. In Indonesia, the implementation of disaster management is handled by the National Disaster Management Agency (BNPB) at the central level and the Regional Disaster Management Agency (BPBD) at the regional level[4]. Medicine and medical supplies are crucial that always needed during the disaster. The medicine management to support the health services during the disaster must be handled by skilled health care professionals including pharmacists. Here, the role of pharmacists is very much needed in handling existing drugs and supplies, because the drugs that distributed to the victims of disaster come from existing stocks around the disaster area, and pharmacists is the one who responsible for the medicine management in the community.

Health workers also mobilize to the place of disaster when a disaster occurs, which is in a Crisis Response Team. The team consists of the Rapid Response Team, the Rapid Assessment Team (RHA Team), and the Health Assistance Team. Pharmacist is one of the health workers involved in the team. According to the Pedoman Teknis Penanggulangan Krisis Kesehatan Akibat Bencana made by Ministry of Health of the Republic of Indonesia, pharmacists were involved in one at Rapid Reaction Team and two at Health Aid Team assisted by four pharmacist assistants. Together with other health workers, pharmacists jumped in to help launch the disaster management process.

A much bigger roles of pharmacists in the disaster management could be found in other countries. For example, a guideline published by the National Association of Board of Pharmacy in 2006. In the guideline, it was stated that the role of pharmacists is divided into four stages, namely Early Preparation for Emergency or Disaster, Immediate Response to Emergency or Disaster, Short-term Response in 72 hours after the disaster, and Long-term Response within 72 hours up to 30 days (or longer) after a disaster. In each stage, the role of pharmacists is needed and there is collaboration between other health workers or related stakeholders[5].

2. Method

In this paper, we used literature review to describe the role of pharmacists in disaster management. The data were collected through some databases such as: Medline, Google Scholar, and Scopus with keywords that have been defined previously. A filtering process was done to find articles that meet our topics and needs. The paper then were reviewed and compared with the data of disaster events in Indonesia and other countries

regarding the role of pharmacists and their existence in disaster management. The review also used guideline that are published in Indonesia by Ministry of Health Indonesia and other country (America by National Association of Board of Pharmacy) to compared the fact and what it should do.

1st step: Finding journals and articles.

In this paper, we used online databases to search for articles and journals related to the topic being sought. The following search terms were used to search articles in the databases: "Role AND Pharmacist AND Disaster AND Management" for Scopus and Medline, while for Google Scholar is the "Role Pharmacist". From the articles found, a selection process was carried out so that only a few articles would later be used in the data analysis process.

2nd step: Filtering journals and articles.

All articles then were inserted in the library manager (Mendeley) based on the inclusion criteria. The inclusion criteria are all articles published between 2007 – 2018 and discussing about disaster from Indonesia or other countries that have been subject to considerable natural disasters, and contain information regarding the role of pharmacists during disasters or events that explain health management during disasters in places affected by the disaster were included. From these criteria, we obtained 26 articles that met the inclusion criteria and will be explained in the next section.

3. Result and Discussion

Pharmacy staff, both pharmacists and staff technical pharmacy, have a responsibility to provide services pharmacy in various situations that require treatment. Even though the role of pharmacy staff in general has increased, it needs to be realized that pharmaceutical staff should be able to have more responsibilities in the health system to improve service quality. One of community pharmacy roles is gives service when a disaster occurred. In this situation, in besides the role to regulating and distributing drugs and medical devices, pharmacy personnel also play a role in educating and counseling patients during the disaster. The functions of this role include ensuring the safety of drugs and the proper use of drugs, preventing the occurrence of drug toxicity, minimizing the emergence of side effects, identifying medical or physiological conditions, monitoring the side effects that occur as well as safety benefits, and monitoring compliance with victims of natural disasters [6][7].

Disaster management is a management of the use of existing resources to deal with disaster threats by planning, preparing, implementing, monitoring and evaluating at each stage of disaster management, namely: a. Pre-disaster stage, activities include prevention, mitigation and preparedness; b. Stage during a disaster, activities included emergency response and emergency recovery; c. Post-disaster stage, activities included rehabilitation and reconstruction. As one of the health human resources, pharmacists are also involved in disaster management [8].



Fig 1. Disaster Management Cycle

At the pre-disaster stage, pharmacist's task assisted by pharmacist assistant is to plan and prepare medical supplies, including medicines for first aid and emergency cases, and medical devices, which are needed at emergency. At the emergency response phase, the pharmacist's task is to ensure the stock and distribution of medicines to affected areas. In addition, pharmacist works with other health personnel to manage and monitor the patient therapy. At the post-disaster phase, pharmacy staffs together with other health workers are in charge to provide post-disaster health services including drug use counselling and conducting inventory and evaluation of actions taken[9].

Pharmacists in Indonesia still have a minimal role in disaster management. One of the movements by Indonesian pharmacists is the Apoteker Tanggap Bencana. During the earthquake in Lombok, PP IAI has sent assistance through the West Nusa Tenggara regional government in the form of funds and goods. This assistance was followed by the deploying of four volunteer pharmacists who took turns starting September 6, 2018 to September 25, 2018. According to the General Chairperson of PP IAI, Dr. Nurul Falah Eddie Pariang Apt, there was a delay in pharmacy services at the disaster site because the logistics were not well-organized and this could be managed by the presence of pharmacists. Volunteers then assigned to several health facilities in Lombok to overcome the problems included logistics arrangements and pharmaceutical services[10].

To prepare pharmacists in handling disasters, the Indonesian Pharmacist Association (IAI) Banten Regional Board in collaboration with the National Agency for Disaster Management (BNPB) of Banten Province held a 2-day Apoteker Tanggap Bencana (ATB) at 22 - 23 September 2018 in Pasanggrahan Carita Forest Park Pandeglang. According to the Indonesian Young Pharmacist Group (IYPG) Competency Division, Yuyun Kurniati S.Farm., Apt, in handling disasters, scientific provision is not enough, so emergency response training, first aid, drug management, building tents, rescue, evacuation, coordination of related parties and experience dealing with problems at the disaster site. This training was attended by 81 Pharmacists from several regions of Indonesia[11].

Meanwhile, the role of pharmacists in other countries is well-organized and pays attention to various aspects. In 2005, Katrina stormed in the south-eastern United States. In this disaster, the role of community pharmacists is very important. Before the disaster occurred, the head of the health department at Jefferson Country instructed pharmacists to add sufficient existing drug stock for 72 hours. Some drugs that must be present are medicines for hypertension, diabetes, COPD, CVD, GIT disorders, and asthma medications. After tracing, it turns out that the guideline related to any drugs used is still not available so it needs to be included for further preparation. Local pharmacies also help by making prescriptions in the form of faxes and messaging services between drugs to the affected areas so as to facilitate the task of existing health workers[12].

In 2017 there has been a Hurricane Maria in Puerto Rico. Pharmacists in the area suffer from drug shortages, because of the high demand and supply that are lacking due

to limited communication and transportation. Learning from Hurricane Katrina in 2005, pharmacists in America have made documentation so that they can prepare any stock of medicines that must be immediately provided to local residents. The obstacles that occur in the event of Mary Hurricane are that pharmacists who are in the disaster area need pre-existing protocols which were not available at that time[13].

In 2011 there was an earthquake that continued with the tsunami in eastern Japan. The Minamisanriku area, Miyagi Prefecture is one of the worst affected. Pharmacists in the disaster area work swiftly by asking the refugees of the disaster in the area, whether they have a chronic disease and how to treat it. This is because when disaster happens, people tend not to carry property including personal medicines. The role of pharmacists is very necessary to make sure there is no disease complication in patients[14].

In Australia, there has been a Tasmanian bushfire disaster occurred in 2013. It was explained that community pharmacies really need government assistance when a disaster occurs to facilitate the provision of services when a disaster occurs. In addition, it is necessary to have a "free of charge" on the supply of medicines given during disasters so that patients are easier to get the medicines needed[15].

In 2006 the FIP (International Pharmaceutical Federation) made a statement that pharmacists can move during an emergency. But in reality, there are still many tasks that have not been done. Two important tasks carried out by pharmacists are regulating the supply of medicines and making a list of existing activities. However, pharmacists also need to pay attention to other things such as data collection of drugs used and vaccinations. With the role mapping of the tasks carried out by pharmacists during disasters, they will be able to confirm and explain in more detail the role of pharmacists[16].

4. Conclusion

In handling disasters, the role of pharmacists in Indonesia still lack. For this reason, it is necessary to improve the performance of pharmacists in handling disasters. Based on the literature review that we did, we propose several suggestions, there are:

1. Pre-disaster: Conduct regular disaster response pharmacist training and preparation of medicines by local pharmacies that can meet medical needs within 3x24 hours after the first disaster occurred and financed by the government.
2. During the disaster: Record victims who suffer from chronic illnesses then provide necessary therapy and local pharmacies that cooperate in fulfilling medicines that are less like prescription drugs.
3. Post-disaster: Evaluate and document activities that have been carried out when the disaster occurred.

Acknowledgment

We have been discussed with Elida Zairina, S.Si., MPH., Ph.D., Apt, one of the pharmacists who concern about the pharmacist role in disaster management in Indonesia.

References

- [1] M. R. Amri *et al.*, *Risiko Bencana Indonesia*. Jakarta: BNPB, 2016.
- [2] Kementerian Kesehatan RI, "Profil Penanggulangan Krisis Kesehatan Kabupaten/Kota Rawan Bencana". Surabaya : Pusat Krisis Kesehatan Kementerian Kesehatan RI. 2017
- [3] S. P. Nugroho, "1.999 Kejadian Bencana Selama Tahun 2018, Ribuan Korban Meninggal Dunia," *BNPB*, 2018. [Daring]. Tersedia pada: <https://bnpb.go.id/1999-kejadian-bencana-selama-tahun-2018-ribuan-korban-meninggal-dunia>. [Diakses: 16-Des-2018].
- [4] Departemen Kesehatan RI, "Pedoman Teknis Penanggulangan Krisis Kesehatan Akibat Bencana". Jakarta : Departemen Kesehatan RI. 2007
- [5] National Association of Boards of Pharmacy, *Emergency and Disaster Preparedness and Response Planning: A Guide for Boards of Pharmacy*. Mount Prospect, 2006.
- [6] Khuswarwanti W, and Dewi SC, Setiawati MK, "Pengoptimalan Peran Apoteker Dalam Pemantauan Dan Evaluasi Insiden Keselamatan Pasien", *Jurnal Farmasi Klinik Indonesia*, 3(3). 67-76. 2014
- [7] Lai E, and Le Trac, Lovett A, " Expanding The Pharmacist's Role In Public Health", *Universal Journal of Public Health* 1(3), 79-85. 2013
- [8] Kementerian Kesehatan RI, *Pedoman Teknis Penanggulan Krisis Kesehatan Akibat Bencana*. Jakarta, 2011.
- [9] M. Faradilla, "Peran Tenaga Kefarmasian dalam Penanggulangan Bencana (Role of Pharmacist in Disaster Management)," *Pharm. Sci. Res.*, vol. 5, no. 1, hal. 14–18, 2018.
- [10] L. Setyaningsih, "Relawan Apoteker Memberikan Bantuan Penuhi Kebutuhan Apoteker untuk Lombok," 2018. [Daring]. Tersedia pada: <http://wartakota.tribunnews.com/2018/09/28/relawan-apoteker-memberikan-bantuan-penuhi-kebutuhan-apoteker-untuk-lombok>. [Diakses: 04-Jan-2018].
- [11] Y. Kurniati, "Training Apoteker Tanggap Bencana (ATB)," 2018. [Daring]. Tersedia pada: <http://iai.id/iypg/newsdetail/training-apoteker-tanggap-bencana-atb>. [Diakses: 04-Jan-2018].
- [12] M. D. Hogue, H. B. Hogue, R. D. Lander, K. Avent, dan M. Fleenor, "The Nontraditional Role of Pharmacists After Hurricane Katrina : Process Description and Lessons Learned," *Public Health Rep.*, vol. 124, no. April 2009, hal. 217–223, 2009.
- [13] K. Melin dan C. E. Rodríguez-díaz, "Community Pharmacy Response in the Aftermath of Natural Disasters : Time-Sensitive Opportunity for Research and Evaluation," *J. Prim. Care Community Health*, vol. 9, hal. 1–4, 2018.
- [14] T. Hashimoto dan H. Sato, "Earthquake, Tsunami, and Pharmaceutical Care in Eastern Japan," *J. Am. Pharm. Assoc.*, vol. 51, no. 5, hal. 568, 2011.
- [15] P. W. Mak dan J. Singleton, "Burning Questions : Exploring the Impact of Natural Disasters on Community Pharmacies," *Res. Soc. Adm. Pharm.*, hal. 1–10, 2016.
- [16] M. Alkhalili, J. Ma, dan S. Grenier, "Defining Roles for Pharmacy Personnel in Disaster Response and Emergency Preparedness," *Soc. Disaster Med. Public Heal.*, hal. 1–9, 2017.

AUTHOR BIOGRAPHY



Name : Yuna Fajar Herdiansyah
Date of Birth : Trenggalek, July 19, 1996
Sex : Male
Institution : Universitas Airlangga
Major : Pharmacist Education (Bachelor)
E-mail : yuna.fajar.herdiansyah-2015@ff.unair.ac.id
Phone Number : +6282257682206

AUTHOR BIOGRAPHY



Name : Andi Mar'ie Ramadan Nurussalam
Date of Birth : Kolaka, January 17, 1997
Sex : Male
Institution : Universitas Airlangga
Major : Pharmacist Education (Bachelor)
E-mail : andi.marie.ramadan-2015@ff.unair.ac.id
Phone Number : +6285257375920

AUTHOR BIOGRAPHY



Name : An Nisa Nur Laila
Date of Birth : Malang, January 20, 1998
Sex : Female
Institution : Universitas Airlangga
Major : Pharmacist Education (Bachelor)
E-mail : an.nisa.nur-2015@ff.unair.ac.id
Phone Number : +6283848495805