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Research Article

Analysis of Medicine Use in Disaster Management

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ABSTRACT

Medicine is the basic logistics to meet the basic needs in disaster management. The use of medicine in disaster management is adjusted to the needs during a disaster. Different types of medicine on pharmacological effects determine the use of medicine in the disaster emergency category. This research is to analyze the use of medicine based on the types of markers and pharmacological effects needed in disaster management. Data collection used descriptive design and methods based on medicine use in the last five years of disaster management in Karanganyar district collected from medical records and interviews. Medicine was categorized based on the drug packaging labeling as general sales list, pharmacy medicines, prescription-only medicines, and controlled group medicine. Based on the effect of pharmacology, medicine can be used as vaccines, psychotropics, multivitamins, analgesics, antipyretics, antibiotics, antiviruses, corticosteroids, mucolytics, anthelmintics, gastritis, and flu. So it is concluded that based on the type of marker, there are three, and not all medicines that have a pharmacological effect are used in disaster management. The implication of this study is that medication requests should align with the needs of the specific type of disaster.

Keywords: Medicine; disaster management; use of medicine in disasters

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INTRODUCTION

Medicine is basic logistics in meeting basic needs during disaster management. The distribution of medical logistics is generally regulated under PMK No. 75 of 2019, as outlined in Article 7, paragraph (5), which states The distribution of logistics and equipment during a disaster, as referred to in paragraph (4) letter c, is carried out with consideration of a. requests from disaster-affected areas; b. the estimated severity of the disaster, the number of victims, and the types of diseases; and c. the allocation of distribution costs in accordance with the applicable laws and regulations (PMK 2019b). Thus, the distribution of medical logistics to disaster-affected areas is carried out based on requests from the impacted regions, taking into account the severity of the disaster, the number of victims, the types of diseases that emerge, and compliance with the distribution cost allocation as regulated by applicable laws and regulations. The provision of logistics is carried out through procurement mechanisms or assistance, both from domestic and international sources. The management of donated medicines is based on needs and quality standards as stipulated. Meanwhile, national aid medicines and supplies that do not meet the needs and cause issues during receipt must be destroyed. Handling health problems in disaster conditions is intended to ensure the provision of health services for victims of the disaster.

Disaster is defined as an event or series of events that threaten and disrupt people's lives caused by natural factors, non-natural factors, or human factors, resulting in human casualties, environmental damage, property losses, and psychological impacts. Based on Law No. 24 of 2007 on Disaster Management, it is carried out in three stages, namely pre-disaster, emergency response, and post-disaster (BPK RI 2007). According to the data from the National Disaster Management Agency, in 2021 there were 32 earthquakes, 1 volcanic eruption, 15 droughts, 632 landslides, 804 extreme weather events, and 1,298 floods (BNPB 2022). The management of medicines in Karanganyar Regency is carried out in accordance with PMK No. 51 of 2019 on the management of medicines. It is stated that the governance of medicine distribution, including during emergencies or disasters, must meet standards of safety, quality, and effectiveness (PMK 2019a). The distribution of medicines is regulated by the local government policy, and therefore, the Karanganyar Regency Health Office distributes medicines based on the type of disaster in the affected areas.

Management of medicine and medical supplies in crisis or disaster conditions in Indonesia refers to the Indonesian Disaster Map Book published by the Ministry of Health of the Republic of Indonesia. Medicine and medical supplies that must be available at disaster locations follow the trend of diseases that often appear in disaster situations and in refugee camps. As stipulated in Chapter 10 of Law No. 36 of 2019 on Health, the government is responsible for preventing, controlling, and eradicating infectious diseases. This includes addressing

infectious diseases in disaster situations, such as COVID-19, respiratory infections, and skin diseases. The availability of medicine at health posts or health centers sourced from the District/City Health Office is key in handling disaster victims.

A good supply of medicine is useful for the rapid handling of disaster victims as of disease outbreaks will be resolved and the condition of disaster victims improve immediately. The use of medicine in disaster management must be carefully planned and administered according to type and effect, but the medicine must be given according to the type and effects. Types of medicines marker include the group of over-the-counter medicines, limited over-the-counter medicines, and prescription medicines. Based on the medicine effect is the pharmacological effect. The pharmacological effect provides accuracy in the selection of medicine for patients including disaster victims by pharmacists. The role of pharmacists before a disaster occurs is to project estimates of diseases that often occur during a disaster, prepare medicine according to the incidence of the disease, and prepare buffer stock at the nearest health facility from the area where the disaster occurred. Pharmaceutical personnel (Pharmacists and Pharmaceutical Technical Personnel) are responsible for the availability of drugs and ensuring the correct use of it when disaster occurs (Setiyarini et al. 2020).

This study aims to analyze what types of medicines are used in disaster management in Karanganyar Regency, as one of the disaster-prone regencies in Central Java, and this study has never been conducted by previous researchers. By knowing the medicine used in disaster management, it can be a guideline or reference in procuring medicine during a disaster so the stock of medicine is safe and fulfilled for the needs of disaster victims.

DATA AND METHODS

Data

The documentation of drugs used in disaster management for the last 5 years according to the Karanganyar Regency Health Office from 2017 to 2022.

Methods

This study is a non-experimental research with a descriptive quantitative design and a retrospective approach. The medicines used during the last 5 years of disaster management in Karanganyar Regency included in this study are limited to solid and liquid preparations used.

RESULTS

Types of medicine in disaster management in Karanganyar Regency are basically based on the disaster that occurred, a description of medicine groups based on marker types can be seen in Table 1.

Table 1. Disaster Management Medicine Based on Group

Description	Total	Percentage (%)
Over-the-counter drugs	8	23.5
Limited over-the-counter drugs	1	3
Prescription drugs	26	73.5
Total	**35**	**100**

Source: Research data, 2023

The first drug group used in disaster management is prescription medicine (73.5%), then over-the-counter medicine (23.5%) and the lowest is limited over-the-counter medicine, 3 percent. The pharmacological effects of medicines used in disaster management obtained 11 pharmacological effects as described in Table 2.

Table 2. Disaster Management Medicine Based On Pharmacological Effects

Description	Number of drug items	Percentage (%)
Analgesics & Antipyretics	6	17
Anti-inflammatory /Corticosteroids	2	6
Antibiotics	2	6
Antivirus	3	8.5
Antiemetics	1	3
Flu	1	3
Gastritis / Ulcers	1	3
Multivitamins	6	17
Mucolytics	3	8.5
Psychotropics	4	11
Vaccines	6	17
Total	**35**	**100**

Source: Research data, 2022

Explained on the percentage of medicine names used in disaster management, it can be grouped into pharmacological effects as multivitamins and vaccines, which are the highest percentage (17%) in the second place is 17% from the analgesic and antyipyretic group. Furthermore, the mucolytic 8.5% and antivirus groups are 17%, the anti-inflammatory or corticosteroid group, and antibiotics are 6%. At the lowest percentage, based on the number of medicine items according to pharmacological effects as antiemetics, flu, and ulcers is 3%.

DISCUSSION

Medicines as basic logistics used in disaster management are available based on needs in disaster areas. Based on data obtained from the Pharmacy

Installation of the Karanganyar Regency Health Service, it is known that the drugs used in disaster areas based on the type of preparation are solid and liquid. Prescription drugs are a type of drug marker that is widely used in disaster management. Prescription drugs are drugs that are considered unsafe, or diseases that are indicated cannot be diagnosed by common people, so the use must be based on a doctor's recommendation and submitted by a pharmacist or pharmaceutical technician authorized by the pharmacist (Anief 2021).

The types of medicines used in disaster management based on their preparation are solid and liquid forms. Solid forms are known to be tablets and capsules, while liquid forms are known to be syrup. Tablets and syrups are used orally where the drug is given through the mouth so that it is practical, easy and safe to be given to patients or disaster victims where the conditions of the place and environment support (Citra 2020). As stated on the data obtained in the field, examples of drug preparations commonly used in disasters are paracetamol, antasida doen, mefenamic acid, and amoxicillin. Injections as another example of liquid drugs, the preparation is given parenterally or outside the intestine and is chosen if a fast, strong effect is desired for disaster victim patients who need emergency treatment because this drug preparation does not pass through the intestines for the absorption process, so it has a fast reaction especially in disaster victim patients especially in unconscious conditions or difficulty swallowing (Dampung, Niku, and Halim 2019). The list of injections that are widely used in this research data is vaccines.

The selection of medicine types used in disaster management follows the trend of diseases that often appear in disaster areas, including refugee camps, such as diarrhea, upper respiratory tract infections, measles, typhoid, stress, hypertension, eye diseases, asthma, malnutrition, skin diseases, dengue fever, and tetanus (Yunanto 2018). In addition to this, another approach in selecting the type of drug is based on the type of disaster that occurs so that general or emergency treatment guidelines can be used in general. The source of drugs used in disaster management uses the buffer stock principle. The buffer stock principle is the existence of a national medicine stock intended.

Disaster management medicines from the results of this study are also grouped based on marker groups, namely over-the-counter, limited over-the-counter, and prescription as presented in Table 1. Based on the data, it is known that prescription medicine are a type of marker that is widely used with a percentage of 73.5%. The patients' condition is more severe, requiring this type of medication. Prescription drugs are dangerous medicines, so their use must be under the supervision of a doctor and can only be dispensed by a pharmacist (BPOM RI 2018). This medicine has a strong effect so that if used carelessly, it can worsen the disease and cause death (Martin 2018). The type of prescription drug used in disaster management, for example, is antibiotics. Antibiotics based on pharmacological effects are medicines used to treat bacterial infections. So it can

be seen that prescription drugs are given according to the indications, dosage, method of use, and side effects, especially for disaster victims (Songgigilan et al. 2020).

Types of disaster management medicines based on pharmacological effects, as in Table 2 include vaccines, which are used for victims of the COVID-19 disaster. Vaccines are one of the basic needs in handling the COVID-19 disaster. As is known, the occurrence of the COVID-19 disaster until 2021 recorded 1,403,722 positive cases in Indonesia (COVID-19 Handling Task Force 2021). Rely ing on COVID-19 vaccination data, there has been a decrease in confirmed COVID-19 cases with vaccinations starting from January 2020 to December 10, 2022. The achievement of dose 1 was 86.79%, the achievement of dose 2 was 74.37%, the achievement of dose 3 was 36.72%, and the achievement of dose 4 was 0.60%. This percentage is calculated based on the vaccination target of 234,660,020 Indonesian residents consisting of health workers, the elderly, public officials, vulnerable communities, and the general public as well as those aged 12-17 years and 6-11 years (Kemenkes RI 2022).

The use of vaccines can also reduce the severity of individuals who have been infected with COVID-19 so that the vaccine is concluded to be effective in protecting individuals from the SARS-CoV-2 variant (Putra 2022). Dyer's research (2021) showed that the administration of vaccines effectively reduced 80% of individuals confirmed with COVID-19 due to the omicron variation. It can be seen that the purpose of administering vaccines is to provide specific immunity and reduce the morbidity due to viral infections, where COVID-19 is one of the non-natural disasters that has occurred throughout the world, including in Indonesia (Dyer 2021).

The type of medicine that is also widely used in disaster management in Karanganyar Regency is multivitamins. Multivitamins are a combination of various vitamins and minerals that are packaged according to pharmaceutical preparations, both solid and liquid. In its classification, multivitamins are included in the over-the-counter drug group (Setiyarini et al. 2020). Vitamins function in several stages of energy metabolism reactions, growth, and body maintenance. In disaster conditions, multivitamins are needed because disaster victims are in uncertain conditions such as damaged houses so that they sleep in refugee tents and cause adjustments to body conditions (Mulyana, Pamungkas, and Abdurrasyid 2023). The vitamins needed are vitamin C and zinc for immune support, vitamin B complex for energy and metabolism, vitamin D and calcium for bone health, especially for vulnerable groups such as the elderly. Moreover, the victims undergoing treatment need additional multivitamins so that their condition improves immediately. Also for healthy victims who help with the evacuation and reconstruction process where their energy is used for this, the need for vitamins that have not been met from food in the refugee camp can be covered by consuming multivitamins.

Psychotropics are a group of antidepressants and stimulants usually used to treat depression experienced by disaster victims. In addition, phenobarbital can be used to put disaster victims to sleep who experience severe insomnia, it often attacks adults, especially the elderly. The percentage level is the same as psychotropics, namely analgesic antipyretics. Analgesics are pain relievers and antipyretics are types of drugs used to lower high body temperatures (Lee and Simmons 2018). Both are used in disaster management, especially for patients who have experienced impacts or injuries.

Antipyretic analgesics in disaster management are one of the choices for symptomatic therapy, because they are useful for reducing the symptoms suffered by disaster victims, such as fever and pain, which often occur due to infections, minor injuries, or fatigue during disaster conditions. This type of drug is very useful because it can reduce pain while lowering high body temperature or fever. Paracetamol, as a class of antipyretic analgesics based on its markers, is an over-the-counter drug, drugs in this class tend to be safer to use. As a first-line drug in lowering high body temperature, paracetamol does not have side effects as an antiplatelet unlike other antipyretics, which can trigger bleeding and worsen the victim's condition (Jonathan and Yong 2021). Other pharmacological effects are needed according to the condition of the victim in each different type of disaster.

The use of strong medications in disaster management shows the highest numbers because the therapeutic options available for disaster management are predominantly strong medications. This study has limitations, one of which is not presenting data on drug use stock because it is not included in the research objectives. Further research is needed to find out how drug procurement and distribution stocks are in disaster management.

CONCLUSIONS

Analysis of medicine use in disaster management concluded that there are three types of marker groups, namely over-the-counter drugs, limited over-the-counter drugs, and prescription drugs. There are eleven drug groups based on pharmacological effects used in disaster management.

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