

Analysis of Disaster Management Preparedness at Ibnu Sina Hospital Makassar

Meilan Siahaan^{1*}, Rahmat Hidayat²

¹Nursing Science Student, Faculty of Public Health, Indonesian Muslim University, Makassar, Indonesia

²Nursing Sciences, Faculty of Public Health, Indonesian Muslim University, Makassar, Indonesia

Abstract

*Corresponding author:

Meilan Siahaan,
Nursing Science
Student, Faculty of
Public Health,
Indonesian Muslim
University
Email:
meilan@gmail.com

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Background: Disasters are the trigger for the malfunctioning of health services and their facilities. For disaster handling, hospitals must be ready to handle patients in the system to support the handling process. This system is prepared by the implementation of an organizational structure when the disaster management system is activated by the hospital.

Objective: To analyze disaster management preparedness at Ibnu Sina Hospital Makassar.

Methods: This descriptive study assessed 25 preparedness components, including organizational structure, team functions, operational procedures, early warning systems, and communication systems. The sample was the head of K3 emergency management.

Results: The study found that the organizational structure and team functions were 50% complete, operational procedures were only 10% complete, the early warning system was 50% complete, and the communication system was 60% complete. Gaps in operational procedures (90% incomplete) and partial readiness in other areas highlight the need for targeted improvements.

Conclusion: Overall, disaster management preparedness at Ibnu Sina Hospital Makassar remains incomplete across key components. Strengthening operational procedures, formalizing team roles, and enhancing early warning and communication systems are essential. Hospital leadership should intensify training and socialization for all disaster management team members.

Keywords: Disaster management; hospital preparedness; Ibnu Sina Hospital Makassar

Introduction

The World Health Organization (WHO) emphasizes the importance of building safe hospitals, particularly in disaster and emergency situations, where hospitals must be able to save lives and continue providing essential health services to the community. Hospitals must remain structurally resilient and operationally functional during disasters, ensuring uninterrupted healthcare delivery. As complex health service institutions, hospitals are influenced by advancements in medical science, technology, and the socio-economic environment. They must continuously improve service quality and accessibility to achieve the highest possible standard of public health, providing comprehensive promotive, preventive, curative, and rehabilitative services, including inpatient, outpatient, and emergency care (Ministry of Health of the Republic of Indonesia, 2012).

In accordance with Law No. 44 of 2009, hospitals are mandated to deliver complete individual health services while ensuring the safety of patients, communities, the hospital environment, and healthcare personnel. To meet accreditation requirements, every hospital must have a written disaster management plan.

Disasters can severely disrupt healthcare services and facilities, especially when hospitals are constructed without considering disaster risk or proper maintenance. Such vulnerabilities can be mitigated through capacity building, one approach being the “safe hospital” concept. This strategy seeks to protect lives, safeguard medical assets, and maintain uninterrupted facility performance during disasters. The goal is not only to keep hospitals physically intact but also to ensure they remain fully functional during and after emergencies (BNPB, 2016).

Indonesia’s geographical, geological, hydrological, and demographic characteristics contribute to its high vulnerability to disasters caused by natural, non-natural, and human factors. These events often result in casualties, environmental damage, property loss, and significant non-material and psychological impacts (Ministry of Health of the Republic of Indonesia, 2017). Hospitals, as the frontline of medical services, play a crucial role within the Integrated Emergency Management System (SPGDT) from pre-hospital to intra-hospital and inter-hospital referrals. Effective readiness in this system can shorten response times and improve outcomes for critical patients. However, field experience indicates that many hospitals lack adequate preparedness, often due to the absence of standardized disaster response protocols (Husna, 2016).

Previous research supports these observations. Anjarsari (2015) reported that 85% of hospital preparedness at Balung Regional Hospital, Jember Regency, was inadequate, with organizational structures and disaster teams in place but not functioning effectively. While national policies mandate disaster preparedness and prior studies have identified gaps in hospital readiness, limited research has specifically examined disaster management preparedness in hospitals in Makassar. Ibnu Sina Hospital, a key healthcare provider in the city, has established a disaster management team; however, preliminary data collected on June 20, 2024, through an interview with a senior hospital employee revealed that the team’s operations are suboptimal. Communication tools are not functioning properly, although facilities and resources meet service standards. This gap between infrastructure readiness and operational effectiveness highlights the need for a focused analysis of disaster preparedness at Ibnu Sina Hospital Makassar.

Methods

Study Design

The research design serves as a strategy to prove or test variables within the research scope. This study employed a descriptive method with a quantitative approach to objectively analyze the situation regarding disaster management preparedness at Ibnu Sina Hospital Makassar. The focus was on evaluating existing systems, resources, and procedures in place for disaster response.

Samples

A sample is a subset of the entire population selected for study and assumed to represent the whole population (Notoadmojo, 2005). This study used a total sampling technique, where all elements of the population meeting the inclusion criteria were selected. The inclusion criteria consisted of units or sections at Ibnu Sina Hospital Makassar directly involved in disaster management, such as the K3 team, organizational structure, and communication system. The main respondent was the Head of K3, who had direct knowledge of the hospital’s disaster management system. Exclusion criteria included hospital units not involved in disaster management and respondents who were unavailable or unwilling to provide data during the collection period.

Instruments

Primary data were obtained through direct observation and a structured, closed-ended questionnaire developed based on indicators from the Ministry of Health of the Republic of Indonesia related to health crisis management, covering four main dimensions: (1) organizational structure and functions of the disaster management team, (2) operational procedures for disaster response, (3) early warning system, and (4) communication system. The questionnaire underwent content validity testing by three experts in hospital disaster

management to assess relevance, clarity, and comprehensiveness, with revisions made to ensure alignment with Ministry of Health standards. Reliability testing was conducted through a pilot study at another hospital with similar characteristics, yielding a Cronbach's alpha value of 0.82, indicating good internal consistency. Secondary data included hospital regulations, the organizational structure of the disaster team, and administrative documents from Ibnu Sina Hospital Makassar, which served as supporting evidence for interpreting the primary data.

Data Collection

Data collection involved two main techniques. First, direct observation was carried out to assess facilities and structures, including evacuation routes, assembly points, communication equipment, and SOP documents. Second, a structured questionnaire was administered to the Head of K3 to evaluate preparedness across the four dimensions. The findings from observations were cross-checked against questionnaire responses to ensure data triangulation and accuracy.

Data Analysis

Given the descriptive nature of the study, no inferential statistics were applied. Data from the questionnaires and observations were processed through univariate descriptive analysis, calculating absolute frequencies and percentages for each indicator. These were tabulated to provide a clear profile of preparedness levels. Cross-referencing primary and secondary data ensured consistency and validity in findings.

Ethical Considerations

This study was conducted following ethical research principles, with a focus on respecting respondents' rights and ensuring data confidentiality. Ethical approval was obtained from the KEP UMI (Research Ethics Committee) prior to data collection. All participants received informed consent forms explaining the study's purpose, procedures, and their rights to withdraw at any stage without penalty.

Results

Organizational Structure

Based on the data in table 1, it shows that from 6 items, 50% of the organizational structure is complete (available), and 50% is incomplete (not available) so that it can be concluded that the organizational structure, tasks and functions of the disaster management team of Ibnu Sina Makassar Hospital are complete.

Table 1. Distribution of Organizational Structure, Duties and Functions of the Disaster Management Team of Ibnu Sina Hospital Makassar

Yes	Question	available	Not available
1.	Does the hospital already have a team Disaster?	√	
2.	Whether exist Activities Socialization Prevention and disaster preparedness at Ibnu Sina Hospital?	√	
3.	Are the socialization activities of disaster prevention and preparedness carried out regularly and have reached all existing employees of Ibnu Sina Hospital with standardized material content that adjusted to the threat at Ibnu Sina Hospital and its surroundings?		√
4.	Each member Disaster Preparedness Team Has Clear of its duties and functions?		√

5.	Has there been any maintenance preparedness training at Ibnu Sina Hospital?	√	
6.	Are all health human resources who are members of the disaster management team competent in the their respective fields?		√

Source: Primary Data, 2024

Operational Procedures

Based on table 2 data, it shows that out of 10 items, 10% of the answers were complete (available) and 90% of the answers were incomplete (not available), so it can be concluded that the operational procedures in dealing with the disaster of Ibnu Sina Makassar Hospital are incomplete.

Table 2. Operational Distribution of Procedures in Dealing with Disasters Ibnu Sina Hospital Makassar

Yes	Question	Available	Not available
1.	SOUP mechanism mobilization Team Reaction Fast/Brigade Disaster Preparedness.		√
2.	There is a Command System in the hospital that can be activated in the event of a disaster and the arrival of mass casualties.		√
3.	SOPs for disaster handling and mass casualties.		√
4.	Readiness mechanism Changing of Personnel in Handling victim Bulk		√
5.	SOUP to overcome The problem of shortage of medical devices and medicines that not Sufficient for the handling of mass casualties.		√
6.	SOP assisted by Expert Doctors or other health workers from outside the Hospital.		√
7.	SOPs for public communication in disaster situations (media center).		√
8.	A special team to disseminate information to prevent panic.		√
9.	SOP if the hospital is affected by a disaster or is no longer able to accommodate patient.		√
10.	Has the hospital been provided by the region <i>Tribe</i> ?	√	

Source: Primary Data, 2024

Early Warning System

Based on table 3 data, it shows that from 4 items, 50% are complete (available) and 50% incomplete (not available), so it can be concluded that the early warning system at Ibnu Sina Makassar Hospital is incomplete.

Table 3. Distribution of Early Warning System at Ibnu Sina Hospital Makassar

Yes	Question	Available	Not Available
1.	Is there already an early warning system (<i>alarm system</i>) for disaster events in the hospital?		√
2.	Have you Are there any signs/symbols leading to the evacuation route?	√	
3.	In the event of a disaster, does the disaster alarm sound automatically?		√
4.	Whether already exist Point Location to gather at the time of a disaster?	√	

Source : Primary Data, 2024

Communication Systems

Based on table 4 data, it shows that from 5 items, 60% are complete (available) and 40% incomplete (not available), so it can be concluded that the communication system in dealing with disasters at Ibnu Sina Hospital Makassar is incomplete.

Table 4. Distribution of Communication Systems in Dealing with Disasters at Ibnu Sina Hospital Makassar

Yes	Question	Available	Not Available
1.	Is there a communication system in hospitals that is used to coordinate when a disaster occurs?	√	
2.	Is the communication system at Ibnu Sina Hospital still functioning?	√	
3.	Is there a communication device in the form of a telephone and mobile phone available at Ibnu Sina Hospital?	√	
4.	Is there a communication device in the form of HT at Ibnu Sina Hospital?		√
5.	At Ibnu Sina Hospital, do members of the management team already have HT as a communication tool to provide information and coordinate with relevant agencies in the event of a disaster?		√

Source: Primary Data, 2024

Disaster Management Preparedness

Based on the data in table 5, it shows that the variables of organizational structure, tasks and functions of the disaster management team of Ibnu Sina Hospital Makassar are 50% complete and 50% incomplete. Operational procedures in dealing with the disaster at Ibnu Sina Hospital Makassar are 10% complete and 90% incomplete. The early warning system at Ibnu Sina Hospital Makassar is 50% complete and 50% incomplete. The communication system in dealing with disasters at Ibnu Sina Hospital Makassar is 60% complete and 40% incomplete.

Table 5. Disaster Management Preparedness Distribution
At Ibnu Sina Hospital Makassar

Variable	Percentage	
	Complete	Incomplete
Organizational Structure	50%	50%
Operational Procedures	10%	90%
Early Warning System	50%	50%
Communication Systems	60%	40%

Source: SPSS Processed Data, 2024

Discussion

Organizational Structure

Based on the results of research that has been conducted at Ibnu Sina Hospital Makassar, it shows that: The organizational structure of the hospital disaster management team consists of a Chairman who is held by the hospital leadership. The team leader is assisted by the Disaster and Emergency Management Advisor held by the Director, the Disaster and Emergency Management Coordinator held by the Deputy Director General and operational, the Hospital Leadership Team held by the Deputy Director, Non-Hospital held by the City Fire Service of the National Police, the Coordinator of Disaster Management / Emergency held by the Head of the Department. Installation of K3 RS. IBSI, Head of Fire Department of Ibnu Sina Hospital, Head of Emergency Hospital, Head of Building / Floor Officer, Head of Technician, Head of Logistics and Facilities, Public Relations, Head of Security. The organization of this hospital disaster management team is adjusted to the existing hospital organizational structure.

From the results of observations made by the researcher, it shows that the organizational structure at Ibnu Sina Hospital Makassar already exists, and in the form of a special team, each floor and each floor has a disaster team schedule structure that will be replaced every day according to the schedule of the person in charge of each member of the disaster management team.

Disaster prevention and preparedness socialization activities at Ibnu Sina Hospital

From the results of observations and interviews conducted by the researcher, it shows that Ibnu Sina Hospital has conducted socialization but has not been socialized periodically to members of the disaster team and has not been updated since the organization was formed, so many team members do not know that they are members of the hospital disaster team. Among the names listed in the decree, there are also those who are no longer active because the person concerned has moved his place of work and retired. The 56 disaster management teams are poorly socialized. This is reinforced by the informant's statement as follows: "the hospital has done socialization, but I don't know if I am a member of this disaster team, "the hospital has done socialization but it is not done in a routine manner, usually in one year it is held once a year but for 2020 there is no socialization due to the covid-19 pandemic" "I was a member of this management team but it has been a long time and now I am no longer Enter again in this countermeasures team, maybe my name is in this countermeasures team because the structure has not been updated because there are several names that are members of this countermeasures team, there are also those who have retired.

Implementation of preparedness training at Ibnu Sina Hospital

From the results of observations and interviews conducted by the researcher, it shows that Ibnu Sina Hospital has conducted training and simulations held at Ibnu Sina Hospital, while the simulations that have been carried out by the hospital are fire simulations, patient evacuation simulations and training on how to extinguish fires using fire extinguishers and traditional methods. there are also several from the team in the ER who have conducted training outside the hospital.

Description of the Duties and Functions of the Hospital Emergency Management Team. Ibn Sina Makassar

The duties and functions in question are the duties and responsibilities possessed by each member of the disaster victim handling team in the hospital in accordance with the organizational structure that has been prepared. The organizational structure of this disaster team is activated when a disaster occurs, both in the hospital and outside the hospital. From the results of observations at Ibnu Sina Hospital Makassar, the duties and functions of each member of the disaster victim handling team have been determined at Ibnu Sina Hospital Makassar, but there are team members who already know their duties and functions and there are also some team members who do not know their duties and functions. This is reinforced by the informant's statement as follows: "I do not know my duties and functions in this countermeasures team." "My name is in this disaster team but I don't know if I am included in this disaster management team and I don't know what my duties and functions are

Research by Lubis et al., (2019), stated that emergency response organizations have a conformity rate of 79.16%. PT X has an emergency response organizational structure formed through the Decree (SK) of the President Director of PT X. The formation of the organization/team aims to overcome emergencies in the work environment of PT X. Workers who are appointed to be part of the team must understand the actions that must be recognized in the event of an emergency, especially fire. Thus, workers must be equipped with adequate knowledge, for example with training to improve competence in dealing with fires.

The organizational structure of emergency response is the grouping of people and the assignment of tasks for each with the aim of creating activities related to emergencies. In accordance with this goal, the emergency response organization in office buildings should consist of elements of building managers and building occupants (Handayana et al., 2016).

According to the researchers' assumptions, the organizational structure of the Hospital's disaster management team is very important. An organized emergency response organizational structure involving various functions within the organization with the duties and responsibilities of each member can provide benefits in abnormally conditions that are sudden, disruptive to activities and can be dealt with immediately. Based on the results of the research, it is hoped that the structure of the disaster management team will be immediately socialized. The importance of an administrative role that not only compiles the organizational structure but also socializes the structure of the disaster management team on a regular basis so that each human resource involved knows and understands their work and functions in the organization.

Operational Procedures

Based on the results of the research that has been carried out, it shows that Ibnu Sina Makassar Hospital already has a triage area that has been determined at the time of the earthquake in Palu, namely the back hallway on the first floor of Sakir Ibn Sina's house, the parking area near the ER and in front. ER but operational procedures in dealing with the disaster at Ibnu Sina Hospital Makassar are incomplete. Because Ibnu Sina Hospital does not have an SOP for the mobilization mechanism of the Rapid Reaction Team/Disaster Preparedness Brigade, SOPs for handling disasters and mass casualties, SOPs to overcome the problem of insufficient medical equipment and drugs for handling mass casualties, SOPs for assistance from Expert Doctors or other health workers from outside the hospital, SOPs for public communication in disaster situations and SOPs if the hospital is affected by a disaster or is no longer able to accommodate patients. This is because the hospital does not have a special team in handling mass casualties but there are several people in the ER who have participated in the training but the training is from outside,

The interview conducted by the researcher with one of the K3 parties said that Ibnu Sina Hospital already has SOPs about disaster emergencies.

The results of this study are in line with research conducted by Mufida & Martiana (2019), stating that fire emergency response procedures have not been prepared and determined by the leadership. The preparation of procedures refers to emergency response guidelines prepared and determined by the Central PJB environmental manager. This emergency response guideline explains the general provisions; identification, organizational structure,

emergency response materials, command posts, evacuation routes, assembly points, communication systems, recovery procedures, reporting and investigation, training and emergency response simulations. Meanwhile, in the research of Annilawati & Fitri (2019), it was found that there are already disaster emergency response procedures and are in accordance with them, which include fire SOPs, earthquake SOPs, and others, but are still not socialized to workers.

Emergency response procedures must provide several considerations, namely identification of potential emergency situations and locations, details of actions to be taken by personnel during emergencies, evacuation procedures, responsibilities and authorities of personnel with special roles during emergencies, relationships and communication with emergency services, communication with employees, government and other relevant parties and information required to carry out emergency response (Handayana et al., 2016).

According to the researcher's assumption, the operational procedures in dealing with hospital disasters are very important and there needs to be socialization related to the SOPs used, because if the SOPs regarding disaster emergency response are not socialized, it will have an impact on disrupting the evacuation implementation process, because each management and employees do not understand the procedures for handling disasters so that the handling process is not effective and efficient.

Early Warning System

Based on the results of research that has been carried out at Ibnu Sina Hospital Makassar, it shows that Ibnu Sina Hospital already has a sign/symbol to the evacuation route and already has a gathering location, namely there are three gathering points at the back of Ibnu Sina Hospital, there is one on the right side of Ibnu Sina Hospital, and there are six gathering points in the parking lot in front of Ibnu Sina Hospital. The gathering point of Ibnu Sina Hospital can be used for the evacuation process in the event of a disaster, but the early warning system at Ibnu Sina Hospital Makassar is incomplete. This is due to the absence of an early warning system (alarm system) for disaster events at Ibnu Sina Hospital.

The results of this study are in line with the research that has been conducted by Febriawati et al., (2017), stating that disaster management at Dr. M. Yunus Bengkulu Hospital is not optimal and still needs to be improved, such as providing an early warning system, adding evacuation route signs and providing property for a complete field hospital.

Research that has been conducted by Pratamaningtyas et al., (2016), states that the early warning system is not in accordance with existing standards because the Regional General Hospital dr. Soediran Mangun Sumarso Wonogiri only has 3 fire alarms that are manual and all of them are located on the first floor of the hospital while the second floor does not have a fire alarm system.

The early warning system is a series of systems to notify the occurrence of natural events, which can be in the form of disasters or other natural signs. Early warning to the community of disasters is the act of providing information in language that is easily digestible by the community (Ramli, 2010).

According to the researchers' assumptions, early warning systems in hospitals are essential because alerts can be an important key factor linking the preparedness and emergency response stages. With a complete early warning system, it can provide this information quickly and accurately.

Communication Systems

Based on the results of research that has been carried out at Ibnu Sina Hospital Makassar, communication tools in the form of telephones and cellphones have been used as communication tools to provide information and coordinate. However, the communication system in dealing with disasters at Ibnu Sina Hospital Makassar is incomplete. This is because the hospital does not yet have a communication tool in the form of HT, making it difficult to communicate to provide information and coordinate with relevant agencies in the event of a disaster.

The results of this study are in line with the research that has been conducted by Nursaadah et al., (2013), stating that the Aceh Psychiatric Hospital currently does not have a

communication system, so that the impact of the disaster will be greater on mental patients. This is due to the limitations in the pattern of actions and support to handle disasters, both the preparation of fixed procedures when facing disasters, the preparation of disaster plans and training, the formation of disaster management teams, conducting workshops on disaster management, the formation of mobile disaster management teams that are ready to be sent that are coordinated and written.

Research that has been conducted by Nastiti et al., (2017), stated that the communication system used by Hospital X Semarang City for fire management uses a telephone and loudspeakers.

Communication systems and coordinate with each other will monitor each other's performance and provide feedback and have solutions in the wrong circumstances (Handayana et al., 2016). During a disaster emergency, good communication is needed to ensure smooth recovery efforts (Ramli, 2010).

According to the researchers' assumptions, the communication system in dealing with disasters in hospitals is very important because it can ensure the smooth running of recovery efforts and can provide adequate information about potential disasters. Therefore, with the existence of communication tools in the form of HT, the delivery of information in disaster management can still be carried out. Likewise, to coordinate with relevant agencies or institutions even though phones and mobile phones cannot be used in times of disaster. When information can be conveyed well, communication and coordination in disaster management can run optimally.

Conclusion

Based on the results of the research and discussion of the analysis of disaster management preparedness at Ibnu Sina Hospital Makassar, the following conclusions can be drawn: The organizational structure, duties and functions of the disaster management team at Ibnu Sina Hospital Makassar are incomplete. This is because the organizational structure, tasks and functions already exist. However, there are several members of the disaster management team who have changed duties, and retired so there is a need for an update in the structure of the disaster management team and there are team members who do not know that they are members of the disaster management team, the operational procedures in dealing with the disaster at Ibnu Sina Makassar Hospital are incomplete. This is because the hospital does not have a special team in handling mass victims, the early warning system at Ibnu Sina Hospital Makassar is incomplete. This is due to the absence of an early warning system (alarm system) for disasters at Ibnu Sina Hospital, the communication system in dealing with disasters at Ibnu Sina Hospital Makassar is incomplete. This is because hospitals do not have communication tools in the form of HT. For the next researcher, it is necessary to conduct further research on the preparedness of disaster management teams in different locations so that more varied results can be obtained.

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