

Readiness Analysis of Sis Al-Jufrie Hospital and the Bhayangkara Hospital in Palu in Fire Management in the Hospital Occupational Safety and Health Program

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ABSTRACT

Background: Hospital planning in preparedness and response to face emergencies is an important and fundamental part that requires cooperation between work units within the hospital and with other organizations outside the hospital (Al-Shareef et al. 2017). Hospitals need to implement the Hospital K3 Management System because it is part of the overall Hospital management system.

Objective: To analyze the readiness of Sis Al-Jufrie Hospital in Fire Prevention in the Hospital Occupational Safety and Health Program (K3RS).

Method: This research is an evaluative research using a purely qualitative approach.

Results: The readiness of Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu is still not optimal due to the lack of attention from the hospital regarding readiness to face fire disasters as seen from several existing indicators such as a busy work schedule so that the K3RS committee still has difficulty in making a fire training schedule, there are no hydrants or fire detection devices such as sprinklers at Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu, but overall Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu are sufficient because they are equipped with APAR, exit signs, emergency doors and there is a fire training program and there is also a K3RS committee for fire protection.

Keywords: Fire, Hospital occupational safety and health

INTRODUCTION

Hospital planning in preparedness and response to face emergencies is an important and fundamental part that requires cooperation between work units within the hospital and with other organizations outside the hospital (Al-Shareef et al. 2017). Hospitals need to implement the Hospital K3 Management System because it is part of the overall Hospital management system. Fire prevention and control are part of the system and must be carried out to protect all personnel working in the hospital, patients, patient companions, visitors, and assets from the dangers of fire and smoke and other related hazards. Therefore, fire prevention and control requires identification of areas prone to fire and explosions, mapping of high-risk zones, reducing the risk of fire and explosions, fire control, and periodic fire drills (Indonesian Minister of Health Regulation No. 66, 2016).

Preparedness in dealing with emergency situations or disasters aims to minimize the impacts that can cause physical, material, and life losses, as well as operational disruptions, environmental damage, financial losses, and a decline in the hospital's image. When an emergency occurs, the preparation and understanding of hospital staff regarding the emergency needed, tactics and strategies that

may be carried out to deal with the emergency can result in more appropriate decisions so that the emergency can be handled properly (Hick, Hanfling, and Cantrill 2012). Preparing hospital facilities for disaster preparedness is an expensive and complicated process, considering that all areas in the hospital need to be covered. This preparation will include improving drainage, providing emergency tents, and other safety equipment such as fire extinguishers. Most hospital building designs in Indonesia still prioritize K3B, so a comprehensive redesign is needed to become a hospital that is ready to face disasters, which of course will increase costs (Hariyono, 2014).

Emergency fires in hospitals often require medical evacuation of patients, patient evacuation can be done quickly and safely if the hospital's resources and personnel are ready to deal with emergency situations (Schultz CH, Koenig KL 2003). Several hospitals that have a high potential for fire include Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu. This is because the use of diagnostic and therapeutic equipment used in these hospitals is very high, requiring electrical energy. The high use of electricity in these hospitals increases the risk of fire compared to lower-class hospitals. This will also increase with the high BOR (bed occupancy ratio) and outpatient visits. The higher the number of residents in the hospital, the higher the risk of

fire, because it results in increased electricity use and the use of a wider kitchen due to the number of patients who must be served.

METHODS

This study is an evaluative study using a purely qualitative approach. The aim is to evaluate the readiness of fire prevention in the K3RS program at Sis Aljufrie Hospital Palu and Bhayangkara Hospital Palu. This study was conducted through in-depth interviews, direct observation, use of checklists, and discussions with management and field staff. The informants in this study were directors, managers, division heads, unit heads/supervisors, and internal and outsourcing employees.

DATA ANALYSIS

Data analysis in this study used the constant comparison method. This method is an analytical approach that requires systematic testing and allows for concept-based variations (Patton, 2019). Data obtained from various informants were then triangulated. This testing involves comparing data from various sources. Triangulation methods are used, namely comparing interview data with findings from observations and documentation. The results are then summarized and concluded in narrative form or described and explained as clearly as possible

RESULT

Table 1. Characteristics of Informants at Sis Al-Jufrie Hospital and Bhayangkara Hospital, Palu.

No	Position	Sis Al-Jufrie Hospital			Bhayangkara Hospital		
		Gender	Age (year)	Last education	Gender	Age (year)	Last education
1	Head of K3RS	Woman	28	S1	Man	46	SENIOR HIGH SCHOOL
2	Medical Equipment Management Coordinator	Woman	52	S1	Woman	38	S1
3	Safety Security Coordinator	Man	32	SENIOR HIGH SCHOOL	Man	46	SENIOR HIGH SCHOOL
4	Utility system coordinator	Man	51	S1	Woman	30	S1

The characteristics of the informants in this study are grouped into several parts, namely position, gender, age, and last education. The

informants as informants in this study numbered 8 people, where 4 informants were

from RSU Sis Aljufrie Palu and 4 informants were from RSU Bhayangkara Palu.

Table 2 shows that based on the 3 parameter points used as a reference in the analysis of fire management policies at the Sis Al-Jufrie Hospital, Palu 2024, it is known that 3 parameter points do not comply with the documents, although this is in contrast to the results of interviews with related officers who stated that 3 parameter points were in accordance, while according to the results of observations in the field, only 1 parameter point was in accordance with the standard. Minister of Public Works Decree No. 20/PRT/M/2009. Meanwhile, Bhayangkara Hospital found that 3 parameter points did not comply with the documents, although these results were not in line with the results of interviews and observations in the field which showed that 2 parameter points were in accordance with the standards. Analysis of the organization and procedures for fire management at Sis Al-Jufrie Hospital found that 2 parameter points were in accordance with the documents and according to the results of interviews, but these results contradicted the results of observations. Meanwhile, Bhayangkara Hospital showed that 2 parameter points were in accordance with the documents and according to the results of interviews, but contradicted the results of observations. Analysis of the identification of fire hazards and risks at Sis Aljufrie Hospital found that 2 parameter points were in accordance with the documents, but the results of interviews with

officers showed that 2 parameter points were in accordance, while according to the results of observations in the field only 1 parameter point was in accordance with the standards. Meanwhile, Bhayangkara Hospital found that 2 parameter points were in accordance with the documents, this was also in line with the results of interviews with officers and the results of observations in the field.

Analysis of fire coaching and training at Sis Aljufrie Hospital found that 2 parameter points were in accordance with documents and interview results, however, observation results showed that 4 parameter points were in accordance with standards. Whereas Bhayangkara Hospital shows that only 1 parameter point is in accordance with the document, this result is inversely proportional to the interview results and according to the observation results which show that 5 parameter points are in accordance with the standard. Analysis of fire equipment inspection and maintenance result sat Sis Aljufrie Hospital It is known that only 2 parameter points are in accordance with the document, this result is inversely proportional to the results of the interview and observation results, where 6 parameter points are in accordance with the standard. Meanwhile, Bhayangkara Hospital is known to have only 1 parameter point that is in accordance with the document, this result is inversely proportional to the results of the interview and observation in the field, namely there are 4 parameter points in accordance with the standard.

Table 2. Policy Analysis. Organization and Procedure Analysis. Hazard and Risk Identification Analysis. Coaching and training analysis Fire Fighting Management at Sis Al-Jufrie Hospital Palu in 2024

No.	Parameter	PU Ministerial Decree Standard No. 20/PRT/M/2009	Data Collection Results											
			Sis Al-Jufrie Hospital						Bhayangkara Hospital					
			interview		Observation		Documents		interview		Observation		Documents	
			Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1.	Fire fighting management	implementing a fire management system	P			P		P	√ P		P			P
2.	Management Policy	Management policies available	P		P			P	P		P			P
3.	Planning	Planning and installation of fire protection systems	P			P		P		P		P		P
Analysis of Fire Fighting Management Organization and Procedures														
	SOP for fire prevention and response	There are SOPs for fire prevention and response	P		P			P	P		P			
	Implementation of SOP	SOP is known to all building occupants	P		P		P		P		P		P	
	SOP Improvement	SOPs are changed or refined according to conditions		P	P		P		P			P	P	
Fire Hazard and Risk Identification Analysis														
	Fire risk identification	Initial steps in developing a fire management system	P			P		P	P		P		P	
	Fire risk identification methods	Fire risk assessment is basically similar to occupational health and safety (OHS) risk assessment.	P		P			P	P		P		P	
Firefighting and training analysis														
	Obligation to manage fires	The existence of a fire fighting unit (officers, coordinators, fire safety and health experts)	P		P		P		P		P		P	
	Fire risk identification methods	It is mandatory to make notes regarding fire prevention plans.		P	P			P	P		P			P
	Training	workplace fire drills		P	P		P		P		P			P

Education	high school graduate aged 25-45 years and have taken basic fire fighting technical courses level I and II	P		P			P	P		P			P
Competence	Fire fighting must be carried out by competent personnel		P		P		P	P		P			P
Analysis of Fire Equipment Inspection and Maintenance Results													
Timetable	Fire protection system inspections are carried out periodically.	P		P		P			P		P		P
Procedure	There are procedures for implementing inspections and inspection work permits.	P		P			P	P		P			P
Reporting	Report creation as a tool inspection document	P		P			P	P		P		P	
Rescue procedures	There are procedures for rescuing occupants, finances, stopping machinery or installations	P		P		P		P		P			P
Insurance program	Post-fire response and minimizing losses	P		P			P		P		P		P
Emergency information	Contact person for Fire Department, Police, Public Works Department, PLN, PMI, etc.	P		P			P	P		P			P

Table 3. Analysis of Active Fire Protection Systems in Sis Al-Jufrie Hospital And the Bhayangkara Hospital in Palu in 2024

No	Parameter	Total Indicators	Implementation			
			Sis Al-Jufrie Hospital		Bhayangkara Hospital	
			In accordance	It is not in accordance with	In accordance	It is not in accordance with
1.	Light Fire Extinguisher (APAR)	9	5(55.5%)	4(44.5)	5(55.6%)	4(44.4)
2.	Fire alarm	6	3(50.0%)	3(50.0%)	3(66.7%)	1(33.3%)
3.	Detector	7	1 (14.28%)	6 (85.72%)	0(0%)	7(0%)
4.	Pipeline system up right. fire hose and hydrant location	7	3(42.85)	4(57.15)	3(42.85)	4 (57.15)
5.	Water supply	15	5 (33.3%)	10(57.15)	5 (33.3%)	10(66.7%)
6.	Sprinkler	8	0 (0%)	8 (0%)	0 (0%)	8 (0%)

Table 3 shows that based on the 52 indicators used as a reference in the analysis of the active fire protection system at Sis Aljufrie Hospital, it is known that only 17 indicators (32.69%) are in accordance with their implementation, this result is in contrast to the results that are not in accordance, where 35 indicators (67.31%) are not in accordance with the

standard. Minister of Manpower Decree No. Kep.186/MEN/2009. While Bhayangkara Hospital It is known that only 17 indicators (32.69%) are in accordance with their implementation, this result is in contrast to the results that are not in accordance, where 35 indicators (67.31%) are not in accordance with standards.

Table 4. Fire Disaster Management at Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu 2024

No	Parameter	Fire Disaster Management	
		Sis Al-Jufrie Hospital	Bhayangkara Hospital
1	Policy	Conduct routine training every 6 months, conduct simulations in the Rs.sis Aljufrie environment	The existing human resources in K3RS always monitor their team to be able to carry out simulations every 6 months.
2	Organization and Procedures	the organizational structure that has been determined, the human resources should not be transferred to other human resources	the established organizational structure continues to be evaluated in the internal environment
3	Identification of Fire Hazards and Risks	The K3RS team must always be ready to monitor the field for dangers that could trigger a fire risk in the Aljufrie Hospital environment.	The K3RS team is always ready to identify locations that could result in fires in the work environment.
4	Coaching and Training	carry out cooperation with the MOU of the Palu City Fire Department team to always participate in training to improve human resources for handling fires	Carrying out cooperation between the K3RS team and the Palu City Fire Department MOU cooperation on joint simulations, fire handling
5	Fire Protection System	Renewal of fire protection equipment in the RS. Sis Aljufrie environment if there are any that are no longer suitable for use	The protection system in the hospital environment must be updated if it is not adequate.
6	Inspection and maintenance of fire equipment	monitor existing fire equipment systems and carry out maintenance on equipment that is no longer suitable for use	Field inspection with the K3RS Team, monitoring APAR equipment and other maintenance tools if they can no longer be used.

Table 4 shows that based on the 6 parameter points used as a reference in analysis of obstacles to fire disaster management at Sis Aljufrie Hospital Palu Year 2024. It is known that there are obstacles in each point of the standard parameters of the Indonesian Minister of Health Regulation No. 66 of 2016, where for the policy parameters obstacles were found in carrying out routine training every 6 months. As for the organizational and procedural parameters, it is known that there are obstacles where the organizational structure that has been set, its human resources should not be transferred to other human resources. The parameters for identifying fire hazards and risks are known to have obstacles where the K3RS Team must always be ready to monitor in the field the dangers that can trigger the risk of fire in the Rs. sis Aljufrie environment. For the coaching and training parameters, there are obstacles to collaborating with the Palu City Fire Department team MOU to always participate in training to improve human resources for handling fires. In the fire protection system parameters, obstacles were obtained in terms of updating fire protection equipment in the Rs. sis aljufrie environment if there are any that are no longer suitable for use. And for the inspection and maintenance parameters of fire equipment, obstacles were found in monitoring the existing fire equipment system and maintaining equipment that is no longer suitable for use. Bhayangkara Hospital, Palu Year 2024. It is known that there are obstacles in each point of the standard parameters of the Indonesian Minister of Health Regulation No. 66 of 2016, where for the policy parameters obstacles were found in terms of the existing human resources in K3RS always monitor their team to be able to conduct simulations every 6 months. As for the organizational and procedural parameters, it is known that there are obstacles where the organizational structure that has been set continues to be evaluated in the internal environment. The parameters for identifying

fire hazards and risks are known to have obstacles in terms of the K3RS Team being ready to always identify locations that could have an impact on fires in the work environment. For the coaching and training parameters, there are obstacles in carrying out cooperation between the K3RS team and the MOU cooperation between the Palu City Fire Department and the joint simulation, handling fires. In the fire protection system parameters, obstacles were obtained in terms of the protection system in the hospital environment must be updated if it is inadequate. And for the inspection and maintenance parameters of fire equipment, obstacles were found in field inspections with the K3RS Team, monitoring APAR equipment and other maintenance tools if they can no longer be used.

DISCUSSION

Based on the Indonesian Hospital Law, Law No. 44 of 2009, Article 1 Paragraph 1, a hospital is a health service institution tasked with providing comprehensive individual health services, including inpatient, outpatient, and emergency care. Hospitals must be built with good construction practices in mind and must include various equipment that ensures the smooth operation of the hospital.

Essential hospital facilities only include facilities that are directly related to patient care, as well as facilities related to support, namely fire prevention and control systems (Law No. 44 of 2009, Article 11 Paragraph 1). In addition, fire is a threat that everyone must recognize can happen anywhere, so hospitals are one of the possibilities. This happens because hospitals require sophisticated equipment that uses high-voltage electricity. Proper and safe management of high voltage, accompanied by the availability of supporting facilities, is a must; otherwise, a short circuit can cause this risk. This condition can cause a fire if the electric spark is not controlled (Subagyo, 2016). In addition, the kitchen for cooking and brewing with gas or LPG fuel

which can pose a fire hazard if misused is a hospital facility designed to meet the food needs of patients. While the use of gas can also pose a fire hazard if mishandled. Therefore, hospitals must provide fire prevention measures and fire control techniques in order to successfully handle fire risks.

RSUD Sis Al-Jufrie and RSUD Bhayangkara Palu have demonstrated strong readiness in managing fire disaster response organizations. They have formed the K3RS Committee, which serves as the main body for fire prevention and disaster management. This committee involves all employees, conducting scheduled activities where certain members and leaders are appointed to ensure effective fire prevention and emergency response readiness.

Fire prevention is a defense measure against fire hazards that aims to prevent fires and must be applied to every building (Anwar Rahmad, 2013) Policies that support fire prevention activities such as Standard Operating Procedures (SOP) are the first foundation in fire protection. For fire prevention and control, hospitals have implemented policies and SOPs that meet established standards, are comprehensive, and act as risk mitigation factors that ensure the safety of patients and staff. In addition, the hospital environment is made safe from fire including necessary arrangements such as fire prevention facilities that meet acceptable standards.

The results of the analysis concluded that in Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu there are various facilities that can be used for fire disaster management. The facilities that have been prepared in both hospitals are fire extinguishers and adequate emergency exits to facilitate disaster prevention and management. Anwar Rahmad (2019) in his research stated that the main factor in reducing fire damage is by providing information to building occupants in a timely manner. Fire hazard notifications can be delivered through a fire detection system that is specifically designed

to detect early signs of fire such as smoke, flames, or high temperatures. Based on SNI 03-3985-2000, fire detection systems have several types, namely heat detectors, smoke detectors, flame detectors, and gas detectors. One form of building fire prevention certification is to install detectors in locations that have been confirmed to be prone to fire (Faisal, 2010).

A portable fire extinguisher (APAR) is one of the tools used to prevent fires. A portable fire extinguisher is a life-saving tool that can be used by anyone, including firefighters, to protect themselves and their belongings in the event of a fire (Hidayat, Suroto, and Kurniawan, 2017). A portable fire extinguisher (APAR) is suitable for extinguishing fires that are still within the threshold of spread so that they can be operated by the general public. Meanwhile, APAR may not be able to help if it is a common source of fire and results in a very large burned area. Placing APAR along the evacuation route so that it is easily visible and accessible is very important. Based on evidence collected through reports and observations, APAR is used in various areas in the hospital. The types of APAR available on the market are dry chemical powder and carbon dioxide.

In accordance with SNI 03-1746-2000, a clearly marked and protected corridor must be provided for all people to exit the building in the event of a fire and they can access the outdoors as long as they stay for a sufficient time without obstruction along the exit path. Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu have both of these facilities as the number one element of their safety plan for fire development. The facilities consist of exit signs, emergency stairs, and emergency doors. All of these resources have been set according to standards, are in good condition, and their operations are fully operational.

This study is in accordance with the conclusion of Hidayat, Suroto, and Kurniawan (2017) which states that the Lawang Sewu building in

Semarang has also been equipped with a well-maintained and complete fire management system. In addition, this study agrees with the research of Minati Karimah, Bina Kurniawan, and Suroto (2016) which states that Telogorejo Regional Hospital has an active fire protection system with a compliance rate of 52.17%, while at Sis Al-Jufrie Regional Hospital it is 85%.

Humans are one of the most important parts in fire disaster management. Fires can be prevented if humans know effective fire prevention techniques and appropriate response methods. Therefore, personnel must have knowledge, understanding, and skills in fire extinguishing procedures.

The results of interviews and data analysis show that human resources at Sis Al-Jufrie Hospital and Bhayangkara Polri Hospital have good abilities in dealing with fire disasters. This is due to the hospital's commitment to conduct training as part of the fire prevention and response program. One of the main topics of Anwar Rahmad's (2013) research is that training programs are one of the main elements of fire hazard prevention in a building. This program is designed to provide skills and knowledge to hospital staff so that they are able to use the Light Fire Extinguisher (APAR) available in the hospital properly and correctly, and is carried out annually. The training, which is carried out based on the SOP with the help of the Job Action Sheet, is carried out by the hospital and the fire department together and involves all hospital staff, both new and old staff, medical staff and non-medical staff. This strategy is in line with the Regulation of the Minister of Health of the Republic of Indonesia No. 66 of 2016 which states that one of the duties of the K3RS Committee together with the hospital director is to implement the Hospital Occupational Safety and Health System (SMK3) and to carry out K3RS coaching, training, and research. The training went well because the training participants knew how to use APAR properly. APAR is a

light fire extinguisher designed to be used in small fire situations (Minister of Manpower Regulation No: PER.04/MEN/1980). To support this, during the interview, all informants who participated in the training were able to mention the steps for using APAR properly using the TATS method. 1) remove the APAR pin, 2) lift and point the APAR and point the hose at the source of the fire, 3) press the handle to release the extinguishing agent, 4) sweep from one side to the other until the fire is extinguished.

In addition, employees are aware that in the event of a fire, they must immediately report to the designated Fire Response Officer at their location, according to the K3RS unit schedule, who will then contact the operator to manually activate the fire alarm if the alarm does not sound automatically. Employees also understand the actions they must take in the event of a fire, such as evacuating themselves, patients, and salvageable documents, by following the emergency exit signs through the designated doors and stairs. These emergency exits are designed to facilitate evacuation, helping to minimize casualties and injuries (Sumardjito, 2010). Emergency exit routes are equipped with clear signs so that building occupants can quickly evacuate in the event of a fire. Management assessments indicate that employees are proficient in using the hospital's APAR to deal with small fires. However, the hospital also provides hydrants, which have a greater capacity to extinguish large-scale fires, although employees are not yet skilled in their use, because there is no mention of hydrants or their operation. Therefore, regular training is still important so that employees, especially the K3RS unit, can operate all fire extinguishing equipment available in the hospital effectively.

The implementation of planned programs does not always run smoothly, as is the case with the fire response training program at Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu. Based on the results of the interview, several

obstacles were found in implementing this training program. These obstacles, as reported by the management, include schedule conflicts with employee shifts and inadequate program socialization.

The tight schedule and working hours of employees and management make it difficult for the K3RS Committee and management to organize training. Research conducted by Rigen Adi Kowara and Tri Martiana (2017) also found that one of the obstacles in preventing fire hazards is the irregularity of emergency response training. Inconsistent training can reduce employee awareness of fire emergency situations.

In addition, emergency stairs do not have rubber treads to reduce slipperiness when used, and some stairs and exit points still do not have adequate emergency lighting. There are also employees who have not participated in the training program, and the difference in information between management and staff regarding responsibilities in fire prevention and response indicates that the hospital's socialization efforts are inadequate. Job Action Sheets have not been fully communicated to all employees, which is a barrier to the training program. This lack of clarity leaves employees unsure about their specific roles in the event of a fire in the hospital, whether it involves evacuating patients, rescuing important documents, or assisting in extinguishing the fire with the fire extinguisher unit in the hospital environment.

In contrast, supporting informants reported no challenges in participating in the fire response training program. As hospital employees, they did not encounter any problems during the training, as they were not directly involved in the scheduling process, which is a major challenge for management. In addition, employees were not particularly concerned about the fire escapes not having full rubber treads or inadequate lighting on the fire escapes and exit routes.

Regarding the evaluation of the hospital fire response program, an assessment has been conducted every year by an external party, namely the Fire Department, through periodic inspections. This is in line with Angela's research (2006) which states that fire extinguishers (APAR) must be inspected, maintained, and refilled every year by an appointed company to ensure that the equipment is always in optimal working condition. However, there has been no internal evaluation by the hospital itself. Internal evaluation can be done through periodic inspection and maintenance of APAR (Angela, 2006). This shows that the hospital is still more focused on training programs than evaluating their implementation. Routine program evaluation is needed to identify strengths and weaknesses, thus allowing for improvements that can make the program more effective.

CONCLUSION

The readiness of Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu is still not optimal due to the lack of attention from the hospital regarding readiness to face fire disasters as seen from several existing indicators such as a busy work schedule so that the K3RS committee still has difficulty in making a fire training schedule, there are no hydrants or fire detection devices such as sprinklers at Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu, but overall Sis Al-Jufrie Hospital and Bhayangkara Hospital Palu are sufficient because they are equipped with APAR, exit signs, emergency doors and there is a fire training program and there is also a K3RS committee for fire protection.

Declaration by Authors

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