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## FIRE PREVENTION AND HANDLING TRAINING FOR RESIDENTS OF BATU MERAH VILLAGE, SIRIMAU DISTRICT, AMBON CITY

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**Abstract:** Fires can occur unexpectedly, even if you have been careful to use appliances that produce fires in the house; some of the sources of fire are electrical short circuits, gas stoves, burning garbage, cigarette butts, and candles when the lights go out. The purpose of the training in community service is to provide knowledge about the causes of fires and their preventive measures. Participants involved in the training included students of the Public Health Department of STIKes Maluku Husada, Instructors from the Ambon City Fire Service Tribe, and residents of Batu Merah Village, Sirimau District, Ambon City. Training techniques with material presentation, practice and review of results. The implementation method is by identifying problems that occur in objects, determining the priority scale of improvement, and providing problem-solving and *feedback* in the form of result evaluation. The implementation of training can provide knowledge about the factors that cause fires at home so that it can encourage public awareness of the importance of preventive measures to avoid fires. The conclusion of the training in community service is that it can provide knowledge about the factors that cause fires and know preventive measures to minimize the occurrence of fires, and can encourage concern in fire prevention in the community.

**Keywords:** Fire Prevention, Electric Short Circuit and Gas Stove.

## INTRODUCTION

Fires can happen at any time, and the cause can be completely unexpected. House fires can occur at any time unexpectedly; even though you have felt very careful in using devices and equipment that produce fires in the house, it does not mean that you are safe from house fires. A fire is a flame, whether small or large, in an unwanted place and is detrimental (Dewi. K, 2013), and in these conditions, the fire arising from the fire cannot be controlled and is beyond human desire (Ramli, 2010). Many factors can be the source cause of house fires, ranging from electrical short circuits, hose leaks on gas stoves, burning garbage, cigarette butts, and candles when the lights go out.

Negligence is the most common factor that causes house fires, for example, fragile electrical cables that are not replaced immediately or the use of kebels that do not meet standards and are overloaded. In the use of gas stoves, they often never check the gas hose or replace it periodically. The activity of burning garbage in densely populated environments is the cause of fires because there is negligence when burning garbage so the fire from the burned garbage gets bigger and more difficult to control. Fire incidents that occur are mostly caused by negligence factors, and in general, with the increasing needs of the community, they are not always accompanied by concern for the importance of security and safety from disaster threats, one of which is fire (Furi, 2012).

Fire cases based on data from the Ambon City Fire and Rescue Service in the period from January 1, 2024, to July 7, 2024, 857 fires occurred. The highest causative factors for fires were electrical short circuits in 574 cases, gas stoves in 93 cases, burning garbage in 52 cases, cigarette butts in 25 cases, candles in 3 cases, and the rest of the causes, with an estimated property loss of around Rp. 166.21 billion. The average number of fire incidents in Ambon City was 4 cases in one day, not including other areas in Indonesia.

Statistical data on fires that occurred in Ambon City in the last 5 years, starting from 2020 to 2024, are grouped by cause; the highest source of fire occurrence is caused by electricity and stoves. Fire data during 2024 totaled 1355 cases, the cause of fires was electricity 557 cases, cigarettes 51 cases, stoves 102 cases, and others 645 cases.

In residential areas with a large population with a fairly dense building structure, a fire detection system (active protection) is needed that can be used to warn building occupants in the event of a fire (Addawiyah, 2016) because the source of the fire can flare up with a very fast time to burn houses and businesses. Moreover, the location of the fire

is on a narrow road or alley so that it cannot be reached by fire trucks so that the fire is difficult to extinguish.

## **METHOD**

Participants in community service activities included students majoring in Public Health at STIKes Maluku Husada, instructors from the Ambon City Fire Service Tribe, and a number of residents of Batu Merah village, Sirimau District, Ambon City.

Implementation techniques in fire prevention and handling training activities include:

1. The presentation was carried out by a team of students majoring in Public Health. It provided material to increase knowledge and expand insight into the dangers and dominant factors that cause fires and their countermeasures so that with the material that has been delivered, residents can understand, be knowledgeable about, and be prepared to prevent fires and handle them in daily activities.
2. The practice is carried out by instructors from the Ambon City Fire Service Tribe to provide training in the form of practice about fire events that often occur in daily activities at home, especially those related to cooking activities in the kitchen, so that they can understand the potential dangers of gas leaks. Participants carried out practices guided by the instructor about what to do in the event of a fire from a gas stove and how to extinguish a fire caused by a leak in the gas stove hose or a fire that comes from cooking that has burned on the frying pan.
3. Instructors and students reviewed the results to evaluate the series of training activities that had been carried out, starting from material presentations and fire extinguishing practice activities. The trainees provided input or feedback based on the material that had been learned and the knowledge that had been gained from the fire extinguishing practice activities carried out together as an experience to deal with the potential and sources of fire hazards in cooking activities in the kitchen.

The implementation time of fire prevention and handling training activities in community service consists of presentation and practice activities carried out simultaneously on October 8, 2024, while the review of training results is carried out after practical activities.

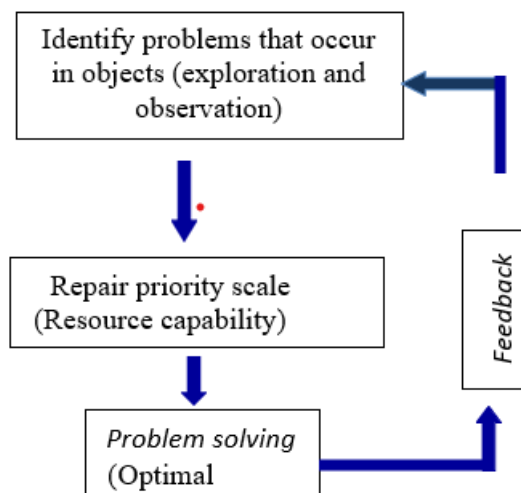
The equipment and materials used to support community service operational activities are banners, plaques or thanks, photocopies of presentation materials, laptops, *infocus*,

observation boards and props in the form of cooking utensils consisting of fryers, gas stoves, regulators, hoses and gas cylinders.

The methods of implementing fire prevention and handling training activities in community service are:

1. The first step is to identify the problems that occur to residents who are the object of community service activities. At this initial stage, it was carried out through exploration and observation activities to identify problems that occurred in Batu Merah Village, Sirimau District, Ambon City residents.
2. The second step is to determine the priority scale that needs to be corrected through interviews with several residents and community leaders. This will give them an overview of the potential, abilities, and weaknesses of residents and formulate the main problems that need to be improved immediately.
3. The third step is problem-solving or optimal solutions by providing training on fire prevention and handling which is carried out through material presentation activities that aim to provide knowledge about the hazards and dominant factors that cause fires as well as countermeasures when fires occur and practical activities to provide experience on how to extinguish fires caused by gas stove fires.
4. The fourth step is to evaluate the results of fire prevention and handling training activities that have been carried out together.

The flow of steps in the method of implementing fire prevention and handling training activities can be made in the problem-solving model in the figure below



**Figure 1. Problem-solving model**

## RESULTS AND DISCUSSION

### Definition of Fire

A fire is an exothermic oxidation reaction that takes place rapidly from a fuel accompanied by the onset of fire or ignition. An uncontrolled flame causes the incident and can threaten the safety of life and property (Ministry of National Education, 2020). A fire can occur if there are 3 things, namely:

- a. There are flammable materials either in the form of solid, liquid or gaseous materials



- b. There are high temperatures caused by heat sources



### Ignition source from electrical short circuit

- c. There is Oxygen ( $O_2$ ) which is sufficient in content, in the condition that the greater the oxygen content in the air, the greater the potential for flame. At an oxygen content of less than 12%, there will be no fire, the normal state of oxygen content in the air is 21%, which is quite effective for the occurrence of a fire.

### Causes of Fire in the House

There are many potential causes of fires at home, namely:

1. Gas stoves

The cause of gas stove fires is because the rubber or seal at the mouth of the gas cylinder is loose so that there is gas coming out from between the neck of the tube and the regulator

attached to the tube, the leaking hose is due to rat bites or splitting due to old age and the hose tie clamps are loose.



**Gas stove hose inspection**



**Gas stove regulator inspection**

## 2. Electrical installation

The factor that triggers a fire is a short circuit or short circuit because electrical equipment is susceptible to short circuits such as plugs and outlets with parallel use or due to loose plug clamps, rat bites that result in peeling off the protective or



**Electrical Circuit: Parallel Consumption**

### 3. Negligence in using equipment

Negligence is often the dominant factor, for example, leaving food ingredients that are being fried for a long period of time so that it can provoke a fire from the stove up to the frying pan which eventually forms a large fire on top of the frying pan that causes a fire.



**Fire from the stove**

The potential fire hazard that often occurs is due to negligence in the use of candles during power outages.



**Candles when the power goes out**

### Fire precautions

#### a. Knowing the triangle of fire

The fire triangle consists of oxygen or air, heat and flammable materials, if one of the 3 elements is not available in sufficient quantities, then there will be no fire.



**Triangle of fire**

b. Control of flammable materials

Fire prevention measures can be taken by controlling combustible materials so that they do not meet the other two elements. In cooking activities in the kitchen, you can identify the potential for fire from the cooking utensils used, namely checking the condition of the gas stove and gas cylinder, when doing cooking activities, make sure you are not doing other activities to avoid negligence that can result in a fire. Make sure the stove and gas cylinder are placed at a safe distance to avoid heat transfer from the stove can propagate to the gas cylinder.



**Placement of the stove and gas cylinder at a safe distance**

c. Flash point control

The most common sources of flames are open flames such as stove flames, electric heaters, oil lamps, cigarette fires, and garbage burning fires.



### **Fire from burning garbage**

#### **Fire extinguishing equipment at home**

To overcome fires, it is necessary to prepare fire extinguishing equipment that is available in the environment around the house, including:

- Water: the availability of a sufficient amount of water near a potentially fire location equipped with the necessary tools in the form of buckets or plastic tubs.
- Sand: which serves to cover burning objects so that air does not enter by piling up burning objects.
- Burlap sacks, cotton fabrics, towels, blankets are used as fire prevention equipment in the home.

#### **Fire prevention and management training activities**

The practice of fire prevention and handling is carried out by instructors from the East Jakarta Fire Service Department.



#### **Instructors provide training materials**



**Instructor practicing leak prevention on gas stoves**



**Documentation with the team, instructors and trainees**

Fire prevention and handling training activities can provide knowledge about the factors that cause fires at home and know the preventive measures, so that it can encourage public awareness to reduce the potential fire hazards that can be carried out in daily activities. Factors that can be the source of the cause of house fires are the use of gas stoves, electrical short circuits and negligence factors in using equipment.

The results of training activities in community service that have been carried out are in line with the results of research by Amat Rahmat, et al. (2018) who concluded that fires in residential houses due to electrical short circuits often occur because people are still negligent and consider it less important to understand the dangers of electronic equipment and non-standard electrical installations. The results of this study are supported by Tasdik Darmana, et al. (2018) who stated that socialization needs to be carried out in an effort to use electrical equipment that wisely for the community can have a positive impact and as a small step but provides great value.

Another research result was carried out by Ranti Hidayawanti (2018) that due to electrical control and faulty installation of electrical cables, it can cause a potential fire hazard due to short circuits. Meanwhile, according to Muhamad Irfanul Hadi, et al. (2019) that the use of current sensors, voltage sensors, and temperature sensors can accurately detect fires and provide appropriate notifications.

The results of the study that obtained the same results with training activities in community service were carried out by Yunita Adilla, et al. (2016) that the factor that causes vulnerability based on public perception is the factor of installing electrical installations that are at high criteria. The results of research conducted by Ani Nidia Listianti, et al. (2018) that the Government through related agencies such as the fire department and other parties such as academics and various communities and organizations should participate in efforts to increase public knowledge or at least remind people about safe behavior through education and socialization either directly or in various media such as print media and internet-based social media to prevent fire at home.

## CONCLUSION

Fire prevention and handling training activities in community service can provide knowledge about the factors that cause fires and know preventive measures to minimize the occurrence of fires in daily activities and can encourage concern for fire prevention and handling in the community.

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