Research Article

The Relationship between Knowledge and Preparedness to Deal with Dense Residential Fires in Antang Village, Manggala District, Makassar City

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Abstract: Residential fires are one of the disasters that often occur in densely populated areas and have the potential to cause major losses both in terms of safety and public health. The level of public knowledge is an important factor that affects preparedness in dealing with these situations. This study aims to analyze the relationship between the level of community knowledge and preparedness to deal with residential fires in Antang Village, Manggala District, Makassar City. The research design used was cross-sectional with a total of 67 respondents selected through simple random sampling technique. Data was collected using a questionnaire that had been tested for validity and reliability, then analyzed using the Chi-Square test with a significance level of 0.05. The results showed a significant relationship between the level of community knowledge and preparedness to deal with residential fires ($p = 0.000$). In conclusion, the higher the level of public knowledge, the better their preparedness in dealing with fire disasters. Efforts to improve education and training on fire simulations are needed periodically to strengthen community preparedness.

Keywords: Community; Knowledge; Manggala District; Preparedness; Residential Fires.

1. Introduction

Residential fires are one of the disasters that often occur in densely populated areas and have the potential to cause material losses, fatalities, and long-term psychological impacts. In Indonesia, cases of household fires have increased significantly in the past five years, especially in high-density urban areas such as Makassar and Jakarta. According to Yenni et al. (2022), fires in residential environments are often caused by negligence in the use of electricity, gas cylinders, and the lack of public knowledge about fire prevention measures. This condition shows that the community's preparedness is greatly influenced by their level of knowledge and awareness of fire risk.

Community knowledge is the main factor in disaster preparedness. Individuals with a high level of knowledge tend to be better prepared mentally and physically to deal with fires, as well as being able to make quick decisions in emergency situations (Cvetković, 2022). On the other hand, a lack of knowledge can result in a slow response, poor decision-making, and an increased risk of fatalities. Augia et al. (2025) show that education and increasing disaster literacy have a significant influence on household preparedness for fires in Padang City. Other studies also confirm that regular fire training and socialization are able to improve an individual's ability to recognize risk sources and mitigate independently (Rahman, 2022).

Several previous studies have proven a significant relationship between knowledge and disaster preparedness. Sari and Noorratri (2023) found a very strong relationship ($p < 0.05$) between knowledge and preparedness in dealing with fires at the rural community level. Wulandari et al. (2023) reported that knowledge and experience are the main predictors of student preparedness for forest fires in Kalimantan. In addition, research by Salmawati et al. (2023) at the Palu Health Center shows that increasing the knowledge of health workers has

an impact on changing attitudes and preparedness for public facility fires. Similar results were also found by Maytadewi Negara et al. (2022) who observed community preparedness in Bali against the risk of seasonal fires and found that knowledge plays an important role in strengthening emergency response measures.

Although various studies have been conducted, most of them still focus on preparedness for natural disasters such as floods, earthquakes, and wildfires. Research that specifically highlights the relationship between urban fire knowledge and preparedness in Indonesia is still very limited (Saifudin et al., 2023). This condition creates a research gap, considering that the characteristics of residential fires are different from natural fires and public facilities, especially in the context of population density, building structures, and limited access to evacuation.

Antang Village in Manggala District, Makassar City, faces significant fire risk due to its high residential density and inadequate safety measures. Studies have shown that areas with high population density and substandard infrastructure are particularly vulnerable to fires (Al-Hajj & Desapriya, 2022). Al-Hajj and Desapriya (2022) emphasize the importance of community-based interventions in reducing fire risks, noting that engaging local leaders and residents can significantly improve fire preparedness and response. Moreover, the effectiveness of such interventions is further supported by Kalogiannidis et al. (2024), who found that community preparedness plays a crucial role in mitigating property damage during fire incidents. Their study highlights that communities with higher levels of preparedness are better able to reduce the costs associated with fire damage, even in vulnerable areas. These findings suggest that enhancing community knowledge and preparedness in Antang Village could substantially reduce the impact of future fire incidents.

Based on this background, this study aims to analyze the relationship between community knowledge and preparedness to deal with residential fires in Antang Village, Manggala District, Makassar City. This research is expected to contribute to the development of community-based disaster education programs and become a reference for local governments in fire mitigation and control efforts in urban areas.

2. Research Methods

This study uses a quantitative method with a cross-sectional approach to determine the relationship between the level of knowledge and community preparedness in dealing with residential fires. The research population is all heads of families in Antang Village, Manggala District, Makassar City, with a total of 81 heads of families. The research sample amounted to 67 respondents who were determined by simple random sampling technique using the Slovin formula ($\alpha = 0.05$). Data collection was conducted in January–February 2025 using a structured questionnaire that has been tested for validity and reliability, with a Cronbach's Alpha value of 0.85 for the knowledge variable and 0.88 for preparedness. The assessment was carried out on a dichotomy and Likert scale, then categorized into good, adequate, and poor based on the results of the total score.

The collected data were analyzed using SPSS version 25.0 through univariate analysis to describe the characteristics of respondents, as well as bivariate analysis with the Chi-Square test to determine the relationship between knowledge and community preparedness. The test results are considered significant if the p value < 0.05. This research has received ethical approval from the Health Research Ethics Committee of the Pelamonia Makassar Institute of Health Sciences (Number: 011/KEPK/IIK-P/2025). All respondents are given the right to refuse or terminate participation and are guaranteed the confidentiality of their personal data in accordance with the ethical principles of health research

3. Research Results

Respondent Characteristics

The characteristics of the Respondent are displayed in the form of a table as follows.

Respondent Age

Table 1. Age Distribution of Respondents in Antang Village, Manggala District, Makassar City 2025.

Age	N	%
17 – 25	5	7,5
26 - 35	33	49,3
36 – 45	29	43,3
Total	67	*100*

Based on table 1, it shows that of the 67 respondents, the age of the respondents with the largest number is Age 26-35 years with a total of 33 people with a total percentage of 49.3%, for Ages 36-45 as many as 29 people with a total percentage of 43.3%, while Age 17-25 as many as 5 people with a total percentage of 7.5%.

Education

Table 2. Distribution of Respondents' Education in Antang Village, Manggala District, Makassar City.

Education	n	%
SD	4	6,0
SMP	9	13,4
SMA	45	67,2
Diploma	3	4,5
Bachelor	6	9,0
Total	67	100

Based on table 2, it shows that out of 67 respondents, the education with the highest number is high school with 45 people with a total percentage of 67.2%, junior high school with 9 people with a percentage of 13.4%, elementary school as many as 4 people with a percentage of 6.0%, diploma as many as 3 people with a percentage of 4.5%, and bachelor as many as 6 people with a percentage of 9.0%.

Gender

Table 3. Gender Distribution of Respondents in Urban Villages.

Gender	N	%
Man	29	43,3
Woman	38	56,7
Total	67	100

Based on table 3, it shows that out of 67 respondents, in the gender characteristics of women as many as 38 people with a percentage of 56.7%, and men as many as 29 people with a percentage of 43.3%.

Univariate Analysis

Knowledge Level

Table 4. Distribution of Respondents' Knowledge Level in Antang Village, Manggala District, Makassar City 2025.

Knowledge Level	n	%
Good	23	34,3
Enough	26	38,8
Less	18	26,9
Total	67	100

Based on table 4 of the total number of 67 respondents, the frequency of the respondents' level of knowledge about disaster management, the highest in the category of sufficient was 26 people with a percentage of 38.8, good as many as 23 people with a percentage of 34.3%, less as many as 18 people with a percentage of 26.9%.

Respondent Preparedness

Table 5. Distribution of Respondents' Preparedness for Fire Disaster Management in Antang Village, Manggala District, Makassar City 2025.

Disaster Preparedness	N	%
Good enough	21	31,3
Less	27	40,3
	19	28,4
Total	67	100

Based on table 5 out of 67 respondents in preparing for fire disasters in the sufficient category as many as 27 people with a percentage of 40.3%, the good category as many as 21 people with a percentage of 31.3%, and the poor category as many as 19 people with a percentage of 28.4%.

Bivariate Analysis

Table 6. Distribution of the Relationship Between Knowledge and Preparedness for Residential Fire Disasters in the Community in Antang Village, Manggala District, Makassar City.

	Good		Enough		Less			p
	n	%	n	%	n	%n	%	
Good	16	69,6	2	8,7	5	21,723	100	
Enough	3	11,5	16	61,5	7	26,926	100	**0,000**
Less	2	11,1	9	50,0	7	38,918	100	
Sum	21	31,3	27	40,3	19	28,467	100	

Based on table 6 from a total of 67 respondents, the level of knowledge was good with good preparedness as many as 16 people with a percentage of 69.6%, sufficient preparedness as many as 2 people with a percentage of 8.7, less preparedness 5 people with a percentage of 21.7%, for the level of knowledge it was enough with good preparedness as many as 3 people with a percentage of 11.5%, sufficient preparedness as many as 16 people with a percentage of 61.5%, Preparedness was lacking as many as 7 people with a percentage of 26.9%, while the level of knowledge was lacking with good preparedness as many as 2 people with a percentage of 11.1%, adequate preparedness was 9 people with a percentage of 50.0%, and less preparedness was 7 people with a percentage of 38.9%.

4. Discussion

The results of this study show a significant relationship between the level of knowledge and community preparedness to face residential fires ($p = 0.000$). Knowledge is one of the main determining factors for an individual's preparedness to face disasters. Highly knowledgeable individuals have the ability to recognize potential risks, understand preventive measures, and be able to take quick action in emergency situations.

Knowledge influences preparedness through risk perception mechanisms, self-efficacy, and practical skills. According to Cvetković (2022), fire safety behavior in residential buildings is highly dependent on knowledge and perception of risks. A study by Wulandari et al. (2023) also shows that students with a high level of knowledge have better preparedness in dealing with forest fires, which confirms that knowledge is the basis for shaping preparedness across disaster contexts.

These findings are in line with research by Sari and Noorratri (2023) who found a significant relationship between knowledge and preparedness in rural communities. Augia et al. (2025) also showed that household fire mitigation education programs have succeeded in increasing public awareness and readiness in dealing with fire risks. In addition, Sheehy et al. (2024) in a study published in the International Journal of Inclusive Education emphasized the importance of community-based and inclusive preparedness education as an effective strategy to change behavior and improve preparedness across generations.

In the local context, community preparedness in Antang Village is influenced by structural and social factors such as population density, substandard electrical installations, and lack of preparedness training. Hargono et al. (2023) suggest that social factors, such as local leadership and community participation, are important variables in strengthening community preparedness for fire threats. Trifianingsih (2022) also emphasized that fire simulation training carried out repeatedly can increase community readiness by up to 40%.

Thus, educational interventions must be integrated with government policies, improving safety facilities, and strengthening social systems. This is in line with the results of a systematic review by Kusumastuti (2021) which highlights the importance of knowledge management in disaster preparedness to create sustainable behavior change. This study has limitations in cross-sectional design that is not able to determine cause-and-effect relationships and narrow scope of locations. However, these findings provide an important basis for further research with longitudinal designs to evaluate the effectiveness of community-based fire education and simulation interventions. Subsequent studies are also recommended to measure objective indicators such as the availability of light fire extinguishers, evacuation plans, and the frequency of training at the household level.

Overall, the results of this study strengthen the evidence that knowledge is a major factor influencing preparedness for fire disasters. Efforts to improve community preparedness need to be directed at increasing fire literacy, practical training, and strengthening public policy

support that encourages a safe culture in residential environments (Cvetković, 2022; Wulandari et al., 2023; Augia et al., 2025; Hargono et al., 2023; Sheehy et al., 2024).

5. Conclusion

There is a significant relationship between knowledge and community preparedness in dealing with residential fires in Antang Village, Manggala District, Makassar City. Good knowledge will increase the community's readiness to face the threat of fire. Related agencies are advised to improve fire education programs, provide training on the use of fire extinguishers, and conduct regular preparedness simulations.

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