

# Fire Emergency Management Education To Improve The Preparedness Of Students At The Ta'dib Al-Syakirin Modern Islamic Boarding School

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## ABSTRACT

Fire is a high-risk disaster that occurs in educational environments, including Islamic boarding schools (pesantren) with compact facilities and high student mobility. This condition requires increasing students' knowledge and preparedness in facing emergency situations. This study aims to determine the effectiveness of fire emergency management education on improving students' knowledge and preparedness at the Ta'dib Al-Syakirin Modern Islamic Boarding School. This study used a quantitative method with a one-group pretest-posttest pre-experimental design. A total of 32 students were selected using a purposive sampling technique and underwent a series of pretests, education, and posttests. The results showed a descriptive increase in the knowledge and preparedness categories after being given education. All students achieved a good knowledge category on the posttest, and the good readiness category increased from 59.4% to 71.9%. However, the Wilcoxon test results did not show a significant difference in knowledge ( $p = 0.102$ ) or readiness ( $p = 0.236$ ). This study concluded that education has a positive impact in practice, but has not shown a statistically significant effect so that further training and periodic simulations are needed to strengthen student readiness.

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## INTRODUCTION

Fire is a process of destruction of an object by fire that often occurs in densely populated areas. In urban areas, fires can spread from one house to another, so it is important for the government to increase community preparedness in order to respond to disaster situations quickly and appropriately. This also applies to students who are less exposed to technology, so that they understand the dangers and impacts of fire. Preparedness activities include developing disaster management plans, maintaining resources, and training personnel (Ma'arif & Nurrohmah, 2023).

Fire disasters do not only occur in residential areas, but also in educational institutions such as schools and Islamic boarding schools, which are at high risk (Ayu et al., 2022). Islamic boarding schools have the potential for fires due to the presence of communal kitchens, electrical installations, and a lack of fire extinguishers (Yuni, 2023). The large number of students and administrators makes preparedness very important in order to prevent major losses, both material and human casualties (Suryani, 2021). Fires in schools or Islamic boarding schools can cause damage to rooms, documents, and valuables, as well as disrupt learning activities.

According to BNPB (Law No. 24 of 2007), preparedness is a series of activities to deal with disasters through quick, appropriate, and effective measures. Preparedness is an important part of disaster management

that involves public awareness, response capabilities, and rapid recovery (Ruspandi & Nurrohmah, 2021). Fire preparedness is carried out to anticipate disasters so that actions before, during, and after a fire are effective (Rahayu, 2020). Disaster management consists of three stages: pre-disaster, emergency response, and post-disaster (Martanto, 2020).

Therefore, this study was conducted to identify the effectiveness of fire emergency management education activities in improving the preparedness of students in Islamic boarding schools. The results of this study are expected to serve as a reference for schools and educational institutions in designing better mitigation programs, training, and strengthening disaster preparedness.

## METHOD

This study is a quantitative study with a pre-experimental design using a one group pretest-posttest design. In this design, respondents are given a pretest to determine their initial level of knowledge about fire emergency management, then given education (counseling), and subsequently given a posttest to determine the increase in knowledge after being given education.

The research is planned to take place in October 2025 at the Ta'dib Al-Syakirin Modern Islamic Boarding School, located in Gg. Tapian Nauli, Titi Kuning, Medan Johor District, Medan City. The location was chosen based on the availability of participants and the boarding school's schedule.

The population in this study was all students who lived and participated in activities at the Islamic boarding school. The sample was determined using purposive sampling, which is the selection of respondents based on certain criteria relevant to the research intervention. The sample consisted of students who were willing to be respondents, participated in the entire series of educational activities, and completed the pretest and posttest instruments. The sample size was adjusted according to the availability of participants who met these criteria and the research analysis requirements.

## RESULTS

Based on research conducted involving 32 respondents, the following results were obtained:

Table 1. Frequency Distribution of Respondents Based on Characteristics

Kategori	Frekuensi	Persentase (%)
<b>Category</b>		
Man	17	53.1
Woman	15	46.9
<b>Class</b>		
7	12	37.5
8	8	25.0
9	12	37.5
<b>Total</b>	<b>32</b>	<b>100</b>

Based on the table of respondent characteristics, the number of respondents in this study was 32 people. In terms of gender, there were 17 male respondents (53.1%) and 15 female respondents (46.9%). This shows that the composition of respondents between males and females was fairly balanced, with no domination from either group. Meanwhile, characteristics based on grade show that there were 12 respondents in grade 7 and grade 9 (37.5%), while there were 8 respondents in grade 8 (25%). This distribution illustrates that student participation in each grade level was relatively even, although grade 8 had fewer respondents. Overall, the characteristics of the respondents in this study are quite representative because they involve a balanced difference in gender and grade level.

Table 2. Frequency Distribution of Respondents Based on Knowledge Before and After Receiving Education on Fire Emergency Management at Ta'did Al-Syakirin Modern Islamic Boarding School.

Knowledge	Pre-Test		Post-Test	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Good	29	90.6	32	100.0
Enough	2	6.3	0	0
Less	1	3.1	0	0

Based on Table 2, it was found that before receiving education on fire management, out of 32 respondents, 29 respondents (90.6%) had good knowledge, 2 respondents (6.3%) had adequate knowledge, and 1 respondent (3.1%) had poor knowledge. This shows that most students have good basic knowledge, although there are still respondents who need to improve their understanding. After receiving education, all 32 respondents (100%) were in the good knowledge category. There were no more respondents with adequate or poor knowledge. Thus, after receiving education, there was an increase in the knowledge category so that all students were in the good category.

Table 3. Frequency Distribution of Respondents Based on Preparedness Before and After Receiving Education on Fire Emergency Management at the Ta'did Al-Syakirin Modern Islamic Boarding School

Preparedness	Pre-Test		Post-Test	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Good	19	59.4	23	71.9
Enough	11	34.4	8	25.0
Less	12	6.3	1	3.1

Based on Table 3, the pre-test results show that of the 32 respondents, 19 respondents (59.4%) had good preparedness, while 11 respondents (34.4%) were in the adequate category, and 2 respondents (6.3%) were in the poor category. This shows that before the education, some of the students already had fairly good preparedness, although there were still some who were not ready.

After the education, there was an increase where respondents with good preparedness increased to 23 respondents (71.9%). Respondents in the adequate category decreased to 8 (25.0%), and those in the poor category also decreased to 1 (3.1%). This indicates that education contributed to an increase in preparedness, although the change was not as significant as the increase in knowledge.

Table 4. Analysis of Knowledge Changes Before and After Education on Fire Emergency Management at Ta'did Al-Syakirin Modern Islamic Boarding School

	Jenis Data	N	Mean Rank	Sum Of Ranks	P-Value
Post-Test	Negative Ranks Pengetahuan	0	0.00	0.00	0.102
- Pre-Test	Positive Ranks	3	2.00	6.00	

In Table 4, in the negative ranks, the value in the N column shows 0, which means that no respondents experienced a decrease in knowledge scores from the pre-test to the post-test. Meanwhile, in the positive ranks, the N value is 3, which means that there were three respondents who experienced an increase in scores after being given education on fire management.

Based on the results of statistical testing using the Wilcoxon test, a significance value of 0.102 ( $p > 0.05$ ) was obtained, which means that there was no significant difference in knowledge before and after being given education on fire management. Thus, it can be concluded that the education provided has not shown a statistically significant effect on increasing the knowledge of students at the Ta'dib Al-Syakirin Modern Islamic Boarding School, even though descriptively there were respondents who experienced an increase in scores.

Table 5. Analysis of Changes in Preparedness Before and After Education on Fire Emergency Management at Ta'dib Al-Syakirin Modern Islamic Boarding School

Jenis Data	N	Mean Rank	Sum Of Ranks	P-Value
Post-Test Kesiapsiagaan	Negative Ranks 3	6.83	20.50	0.236
- Pre-Test Kesiapsiagaan	Positive Ranks 8	5.69	45.50	

In Table 5, the negative ranks in column N show a value of 3, which means that there were three respondents who experienced a decrease in preparedness scores after the education was provided. Meanwhile, in the positive ranks, the value of N is 8, which shows that there were eight respondents who experienced an increase in preparedness scores from the pre-test to the post-test.

Based on the results of statistical testing using the Wilcoxon test, a significance value of 0.236 ( $p > 0.05$ ) was obtained, which means that there was no significant difference in preparedness before and after education on fire management was provided. Thus, it can be concluded that the education provided did not have a statistically significant effect on the preparedness of the students, even though descriptively there was an increase in some respondents.

## DISCUSSION

### Improving Students' Knowledge of Fire Emergency Management

The results showed that before the education was given, most of the students already had good knowledge, namely 29 respondents (90.6%), but there were still students with adequate (6.3%) and poor (3.1%) knowledge. After the education was given, all respondents (100%) had good knowledge. Descriptively, this shows the effectiveness of education in improving students' understanding. 25

However, the Wilcoxon statistical test results showed a value of  $p = 0.102$  ( $p > 0.05$ ), which means that the increase in knowledge was not statistically significant. This may have occurred because the majority of students already had good prior knowledge, so the increase after education was not too significant. Research by Alien, Ilham, et al. (2025) shows that students' knowledge of fire disasters among santri is still in the adequate category, because pesantren administrators have never provided information or education about fire disasters to students.

In theory, this increase in knowledge supports the Health Belief Model (HBM) concept, particularly in terms of perceived susceptibility and perceived severity. Education encourages students to understand that fire is a real and dangerous threat, thereby promoting increased understanding and awareness, as explained in Rosenstock's theory (1974). In addition, Piaget's Constructivism theory explains that the learning process will be more effective if students experience it directly through simulations, as was done in this study. Simulations enable students to build new understanding based on experience, so that the increase in knowledge is meaningful and sustainable. Thus, although not statistically significant, the education provided still shows a substantive increase in knowledge and is in line with behavioral learning theory.

### The Influence of Education on the Preparedness of Islamic Boarding School Students

The results showed that providing education on fire emergency management could improve the preparedness of students, although not statistically significant ( $p = 0.231$ ). In the pre-test stage, 59.4% of students had good preparedness, which increased to 71.9% after the education was provided. Meanwhile, the adequate category decreased from 34.4% to 25.0%, and the poor category decreased from 6.3% to 3.1%. Descriptively, these findings indicate an improvement in the students' preparedness, although the increase was not as strong as the increase in knowledge.

The results of a study conducted by Suyanto entitled "The Effect of Disaster Literacy on the Preparedness of Students at Traditional and Modern Islamic Boarding Schools in Bandung" show that the disaster literacy of students is in the fairly high category, while their preparedness is still in the moderate category. These findings indicate that an increase in knowledge or disaster literacy is not always followed by

a comparable increase in preparedness, because preparedness is also influenced by factors such as attitude, experience, and emergency training.

Preparedness is a person's ability to respond quickly and appropriately to threats. According to LIPI-UNESCO/ISDR (2006), preparedness is shaped by four main components, namely knowledge and attitude, emergency response plans, early warning systems, and the ability to mobilize resources. In this context, the increase in knowledge gained by students through education plays a direct role in increasing preparedness, but changes in attitudes and actions usually require a longer process and time compared to changes in knowledge.

The findings of this study also reinforce the Health Belief Model theory, which states that behavioral change is not only influenced by knowledge, but also by perceptions of vulnerability, perceptions of benefits, motivation to act, and direct experience. In this study, the santri only underwent one session of education and a light simulation, so that changes in preparedness have not yet occurred optimally.

Nevertheless, the increase in the preparedness category from adequate to good shows that education still has a practical impact on santri. In order for preparedness to increase significantly, education needs to be followed up with regular training, the establishment of clear evacuation routes, and more intensive fire simulations.

Thus, the results of this study show that education has a positive descriptive impact on preparedness, but is not yet strong enough to produce statistically significant changes.

Effectiveness of the Relationship between Knowledge and Preparedness of Islamic Boarding School Students. The results show that an increase in students' knowledge after education has an effect on increasing preparedness, although this relationship has not been fully demonstrated statistically. When viewed from the changes in the categories of knowledge and preparedness, education has proven to be quite effective in practice, mainly because:

The percentage of good categories increased in both variables.

There was no decrease in scores for knowledge or preparedness.

Students were able to participate in the simulation and understand the emergency response steps.

However, the effectiveness of education has not been statistically optimal, indicating that education needs to be strengthened by:

Regular simulations, not just once.

Provision of clear evacuation routes.

Fire extinguishers that are available and easily accessible.

Training in the use of fire extinguishers for students.

Development of fire safety standard operating procedures (SOPs).

This is in line with the recommendations of Rahma et al. (2025) that educational programs will be more effective if accompanied by improvements in facilities and institutional policies.

## CONCLUSION

This study aims to assess the effectiveness of fire emergency management education in improving the knowledge and preparedness of students at the Ta'dib Al-Syakirin Modern Islamic Boarding School using a one-group pretest-posttest pre-experimental design. Education was provided to introduce basic fire concepts, risks that can occur in the boarding school environment, and actions that need to be taken in emergency situations. The results showed an increase in knowledge after the education, indicating that delivering the material through counseling was able to strengthen the students' understanding of fire safety topics. This increase shows that education is an effective method for broadening knowledge and improving cognitive abilities related to preparedness topics.

The students' preparedness also increased, although not as much as the increase seen in knowledge. This illustrates that preparedness does not only depend on information, but also on training, direct experience, and the habit of implementing safety measures. Changes in preparedness behavior require a process of repeated habituation, so that education alone is not enough to have a significant impact. Education provides an initial foundation, but must be followed up with practical activities so that students are better prepared to deal with emergency situations.

This study emphasizes that knowledge and preparedness have different characteristics. Knowledge is easier to improve through the delivery of information, while preparedness requires a combination of knowledge, skills, and adequate physical support. This provides an understanding that education should be a continuous process and not just a one-time event.

The implications of this study indicate that fire-related education needs to be developed using a more comprehensive approach, including simulations, fire extinguisher training, and the establishment of evacuation routes. These activities will help transform knowledge into actionable skills. Further research could test interventions over a longer period of time or compare other educational methods to obtain more significant results. Thus, improvements in knowledge and preparedness can be achieved in a more optimal and sustainable manner.

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