



## The Effect of Health Education on Student Knowledge in First Aid Emergency Response to Accidents at SMPN 3 Limboto

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### ABSTRACT

Emergencies often cause panic especially in teenagers or students and one of the factors is the lack of knowledge, so it is important to increase knowledge about the procedures to provide assistance in medical emergency situations by providing education. This study aims to determine the influence of health education on first aid knowledge in accidents. The research design uses quantitative with quasi-experimental methods, one-group pretest-posttest, the number of population, namely all grade IX students as many as 67 students while the number of samples is 67 students or total sampling, this study uses the Wilcoxon test. The results of the study were the knowledge of students before being given the highest educational intervention, namely the adequate category of 58 people and the lowest category of good as many as 9 people, while the knowledge of students after being given first aid education in the highest accident was the good category of 66 people and the lowest category was the sufficient category of 1 person, the results of the Wilcoxon test obtained a significant value 0.000. Conclusion There is an effect of health education on the knowledge of female students in emergency response to first aid in accidents at SMPN 3 Limboto. Suggestions for schools to collaborate with health workers to provide education or training to students about emergency response to first aid in accidents.

### INTRODUCTION

Knowledge is the result of knowing, and this happens after people make sense of a certain object. Sense occurs through the human five senses, namely the senses of sight, hearing, smell, taste and the sense of touch. However, most of it is obtained from the senses of sight and the sense of hearing.

Emergencies often cause panic and one of the factors is a lack of knowledge, so it is important to increase knowledge of the procedures to provide assistance in medical emergency situations. Many of us meet students who have had accidents in the form of broken bones, fainting, sprains, etc., or otherwise receiving the same thing, or even made mistakes in help. This situation of giving is certainly painful and aggravates the student's situation.

Law Number 20 of 2003 National education functions to develop abilities and shape the character and civilization of a dignified nation in order to educate the life of the nation, aiming to develop the potential of students to become human beings who believe and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens.

School is an environment with high physical and social activity so it is prone to emergencies such as fainting/syncope, light-moderate bleeding, choking, seizures, sports injuries, and sudden cardiac arrest. A quick and appropriate initial response in the first minutes is crucial in preventing disability and death, so the readiness of school residents, especially students as the closest helpers, is crucial. Modern school health programs emphasize strengthening first aid (P3K) skills, preparedness planning, and evidence-based routine training. Data in Indonesia from previous research shows that 39.7% of accidents in children occur in the school environment, such as while playing at school, during sports lessons, and during extracurricular activities. Of the many accidents, most of the victims suffered abrasions or bruises as much as 70.9%, 27.5% sprains or sprains, and 23.2% lacerations to fractures. In addition, mild cases such as fainting, choking, nosebleeds, poisoning, fever, and headaches also often occur at school. (Anggrasari & Farida, 2025)

The World Health Organization (2020) reports that around 1.3 million people die each year due to traffic accidents. Statistics of Traffic Accident Incidents in Indonesia in the year from the beginning of 2024 to August 5, 2024, there were 79,220 traffic accidents. The most accidents occurred in April 2024, with 11,924 incidents. The number of vehicles involved in traffic accidents was 722,420 units. Motorcycles are the vehicles with the most accidents, namely 552,155 units. And the number of traffic accident victims reached 117,962 people.

Indonesia faces a high burden due to traffic accidents. According to the Central Statistics Agency (BPS), in 2022 there were 139,258 accidents, with 28,131 deaths. In fact, according to Korlantas' report, in 2024 there will be around 1,150,000 accidents with around 27,000 deaths. This trend shows a tendency that accidents become serious problems that cannot be ignored. With such a large number, it is very important for the community, including students, to have knowledge and readiness in carrying out emergency first aid response, so that the impact of accidents can be minimized.

Accident numbers in Gorontalo Province According to data from the Gorontalo City Resort Police Traffic Unit In 2020 to 2023, the number of accidents in Gorontalo Province was recorded at 502 cases, while in 2024 there were 94 cases of traffic accident victims from January to September and 27 traffic accident victims were teenagers.(Zakia I, 2025)

In some cases of traffic accidents that occurred, the highest injuries and trauma occurred in the group of school-age children, namely between the ages of 15 - 24 years with a total of 19.6%. The high death rate in traffic accident victims can be caused by the wrong way to help the accident victims, such as how to evacuate the victim, transfer him to a means of transportation that will take him to one of the medical installations to get immediate help and so on.

Accidents in daily life often occur in society, sometimes accidents that occur are mild to severe. However, the community has not optimally understood how first aid we can provide if this happens. Many people have a first aid kit in an accident but do not know how and what the item is used for. This needs special attention because if an accident occurs and we are unable to provide help, it can hinder the healing process. Accidents can also occur in the school environment. Children who are still in the process of growth and development will often be in dangerous conditions because of the inadequacy of information they receive. Those who have active characteristics in playing and moving so that they are not spared from safety threats. Another factor of lack of supervision in schools is also the reason for accidents.(Anggrasari & Farida, 2025).

First aid emergency response in accidents for students who are in the First Secondary School (SMP) consists of several principles, of course this principle is based on the age of the student, which ranges from 13 years to 15 years old, the principle is safe where students are able to protect themselves, for example, safe location checks, the principle of calm where students do not panic, for example, breathing, for example, the principle of assessment where students are able to make simple observations for example of question and see, the principle of no harm where students can avoid heavy actions such as do not massage, simple principles that are according to the ability of students for example minor injuries, reference principles where students can involve teachers for example to take to UKS (Sari, 2022).

Research results (Anggrasari & Farida, 2025). Students in the school environment are a high-risk group in accident situations in daily life. Their activity is high enough to move can cause problems and the risk of accident hazards. If the accident experienced is not handled in this way, various health complications can be experienced so that there is a need to understand P3K in the school environment. The purpose of this study is to measure students' knowledge about P3K that can be done in schools. The research method used is quantitative research using a one group pretest posttest experiment design. The sample taken in this study is the entire population of 38 students. Based on the results of the research before being given education, 53% of students were in the poor category, while after being given education 53% were in the category of sufficient knowledge. Data

Based on the results of initial observations conducted by researchers interviewing 10 grade IX students of SMPN 3 Limboto, it is known that only 3 people know what p3k is and 7 out of 10 people do not know what first aid is in an accident. From the results of the interviews, the students only understood the term "helping" in general, but did not know the meaning of first aid in an accident, its purpose, or the basic steps that must be taken when a friend is injured. They said that so far, if a friend falls or is injured, they usually just escort the friend to the UKS room, without knowing how to help properly. This lack of understanding occurs because they have never received direct explanation or education about first aid in an accident, both from teachers and health workers. This condition shows that the lack of knowledge of first aid in accidents in students can make handling emergencies at school late or inappropriate.

## **RESEARCH METHODOLOGY**

### **Place and time of the research**

This research has been carried out at SMPN 3 Limboto. This research has been conducted from December 2025 to January 2026.

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### Research methods

This research method is a quantitative research with a research design using *quasi-experimental, one-group pretest-posttest (non-equivalent control group design)*. This design is used to influence health education on changes in students' knowledge about emergency response to first aid in accidents at SMPN 3 Limboto.

### Population and sample

The population in this study is all grade 9 students at SMPN 3 Limboto which is 67 students. The samples were taken by all 67 9th grade students at SMP N 3 Limboto.

### Data Analysis Techniques

#### Univariate Analysis

Univariate analysis aims to explain or describe the characteristics of research variables. The form of univariate analysis depends on the type of data.

#### Bivariate Analysis

This bivariate analysis will outline the influence of first aid knowledge education on accidents to increase student readiness in emergency response at SMP N 3 Limboto school.

## RESULTS

### Respondent Characteristics

Table 1 Frequency distribution of respondent characteristics

Yes	Characteristics	Frequency (N)	Present (%)	
1.	Age	14 Years	31	46.3
		15 Years	36	53.7
	2.	Gender	Male	30
Women			37	55.2
		<b>Total</b>	<b>67</b>	<b>100</b>

Source: Primary data 2026

Based on the table above, it shows that the characteristics of grade IX students at SMPN 3 Limboto based on the highest age, namely 15 years old, as many as 36 people (53.7%) while the highest gender characteristics, namely the female gender as many as 37 people (55.2%).

### Univariate Analysis

#### First aid knowledge in student accidents before being given educational interventions at SMPN 3 Limboto

Table 2 First aid knowledge in *pretest student accidents*

First aid knowledge in <i>pretest student accidents</i>	Frequency (n)	Presentation (%)
Good	9	13.4
Enough	58	86.6
<b>Total</b>	<b>67</b>	<b>100</b>

Source: Primary data 2026

Based on the table above, it shows that the knowledge of first aid in student accidents before being given educational intervention at SMPN 3 Limboto is the highest in the adequate category as many as 58 people (86.6%) and the lowest is in the good category as many as 9 people (13.4%).

#### First aid knowledge in student accidents after being given educational interventions at SMPN 3 Limboto

Table 3 First aid knowledge in *posttest student accidents*

First aid knowledge in <i>posttest student accidents</i>	Frequency (n)	Presentation (%)
Good	66	98.5
Enough	1	1.5
<b>Total</b>	<b>67</b>	<b>100</b>

Source: Primary data 2026

Based on the table above, it shows that the knowledge of first aid in student accidents after being given educational interventions at SMPN 3 Limboto is the highest category, namely the good category as many as 66 people (98.5%) and the lowest is the sufficient category as many as 1 person (1.5%).

### Bivariate Analysis

#### Data Normality Test

Table 4. Data Normality Test

Variable	Kolmogorov-Smirnov		
	Statistic	df	Sig.
Prettest knowledge	0.518	67	0.000
Posttest knowledge	0.534	67	0.000

Source: Primary data 2026

Based on the results of the data normality test with a focus more on Kolmogorov Smirnov (KS) (the number of samples  $\geq 50$  respondents), the significant value obtained was 0.000 or  $\leq 0.05$  which indicates that the data is distributed abnormally so that the test used is a non-parametric test because this study is an experimental study, the data analysis in this study uses the Wilcoxon test.

### The Effect of Health Education on Student Knowledge in First Aid Emergency Response to Accidents at SMPN 3 Limboto

Table 5 The effect of health education on students' knowledge in emergency response to first aid in accidents

Student knowledge	N	Red	Mean of difference	SD	Pvalue
Pretest	67	21.45	9,61	2.590	0.000
Posttest	67	31.06		1.938	

Source: Primary data 2026

Based on the results of the statistical test, N is the number of samples used, namely 67 female students, the mean value or average score before 21.45 and after 31.06 with a *mean value of difference* or the average difference between before and after the health education intervention is 9.61 while the SD score (*Standard Deviation*) before 2,590 and after 1,938 which showed changes between before and after the intervention with a significant value or *Pvalue* obtained  $0.000 < 0.05$  which indicates that there is an influence of health education on the knowledge of female students in emergency response to first aid in accidents at SMPN 3 Limboto.

## DISCUSSION

### Univariate Analysis

#### First aid knowledge in student accidents before being given educational interventions at SMPN 3 Limboto

The results of the study showed that the knowledge of first aid in student accidents before being given educational interventions at SMPN 3 Limboto was mostly in the sufficient category. This condition illustrates that students already have basic knowledge related to first aid, although it is not optimal. Knowledge that is in the category is sufficient to show an initial understanding of the first aid measures in an accident. However, this understanding is not fully deep and has the potential to cause wrong actions. This initial knowledge is likely to be gained from everyday experience or informal information. The source of information can come from the family, as well as the mass media. However, information obtained in an unstructured manner is often incomplete.

The dominance of the sufficiency category of 86.6% indicates that most students have not reached the optimal level of knowledge. This can be caused by the lack of formal education about first aid in the school environment, based on the information of students and teachers that at SMPN 3 Limboto there is no one who provides education related to first aid. Lack of simulation or hands-on practice can affect students' level of understanding. Knowledge that is theoretical without practice tends to be easily forgotten. This condition has the potential to cause students to hesitate to act when an accident occurs. These doubts can hinder the provision of fast and appropriate first aid. In fact, the speed of treatment greatly determines the severity of the injury.

The results of the study were also obtained in the category of good knowledge only found in a small number of students, which was 13.4%. This number shows that very few students still have a comprehensive understanding of first aid. Students with good knowledge are likely to have received specialized information or training. The training can come from extracurricular activities such as the Youth Red Cross. In addition, the personal experience factor can also affect a student's level of knowledge. Students who have faced an accident tend to have a better

understanding.

The low proportion of good knowledge categories can have an impact on students' preparedness in dealing with accidents. Students with limited knowledge are at risk of inappropriate actions. Wrong actions in first aid can aggravate the victim's condition. For example, mistakes in handling wounds or bone injuries. In addition, students' ignorance can lead to delays in providing assistance. This delay has the potential to increase the risk of complications.

According to Sari (2022), first aid knowledge is one of the important components of promotive and preventive efforts in schools. Schools as a gathering place for students have a fairly high risk of accidents. Physical activities such as sports and extracurricular activities increase the potential for injury. So that students need to be equipped with adequate knowledge. This knowledge is not only theoretical, but also practical skills. Collaboration between schools and health workers needs to be improved. Educational programs involving health workers can improve the quality of learning. In addition, health workers can provide examples of real cases. Case examples help students understand the impact of right or wrong actions. A good understanding will increase students' awareness of the importance of first aid.

Knowledge plays an important role in the success of emergency response. Because many emergency patients lack knowledge about emergency management, patients with emergencies become disabled or even die. This can happen in emergency patients because misbehavior and improper handling can be life-threatening. Knowledge of emergency relief can be obtained through the education process. Knowledge basically comes from obtaining information conveyed by teachers, parents, friends and the mass media (Putu, 2020).

The results of this study are in line with the research conducted by Prasetyo (2022) with the title The Influence of Health Education on the Knowledge Level of Grade XI Students about First Aid in Accidents at SMK Kesehatan Patriot 3 Bekasi. The level of knowledge of students before being given education (pre-test) was 9 people (15%) experienced a poor level of knowledge, and 47 people (78.3%) experienced a sufficient level of knowledge and 4 people (6.7%) experienced a good level of knowledge.

Based on the results of the above study, the researcher concluded that the results of the study show that students' first aid knowledge before intervention still needs to be improved. The dominance of categories is enough to indicate that there is a basic understanding that has not been maximized. The number of students with good knowledge that is still low is a special concern. This condition shows the importance of health education in schools.

#### **First aid knowledge in student accidents after being given educational interventions at SMPN 3 Limboto**

The results of the study showed that first aid knowledge in student accidents after being given educational interventions was in the good category. Most of the respondents were in the good category with a percentage of 98.5%. This condition illustrates that the educational intervention provided as much as 2x has high effectiveness. Health education is one of the methods that has been proven to be able to increase student knowledge. Good knowledge is an important basis in forming the right attitude and behavior when facing emergency situations.

The average category of good knowledge shows that students are able to absorb information optimally. The education was carried out using PPT and *leaflet* methods that were interesting and interactive. Appropriate learning media can improve students' memory of the material. First aid knowledge for students is essential to minimize the impact of injuries. A good educational process will result in cognitive changes. These cognitive changes are the basis for changes in attitudes and actions.

The results of the study showed that as many as 1 respondent who were in the knowledge category was enough with a percentage of 1.5%. This condition can be caused by differences in the individual's ability to receive information. Factors such as concentration, interest in learning and motivation can affect a student's level of understanding. In addition, the background of the student's initial knowledge also plays a role. Based on the results of the study, it was found that in the aspect of food/gas poisoning, students do not understand about artificial breath given only if the victim of poisoning is unconscious, victims of food poisoning can be made to vomit by inserting fingers into the base of the tongue, egg whites or white milk can help neutralize toxins in the body. In addition, in the aspect of wounds and bleeding, students also do not understand about lifting the injured part higher than the heart so that the blood comes out Reduced, the injured part of the body is lifted higher than the heart to reduce bleeding, nosebleeds are stopped by squeezing the right and left noses for 10 minutes and scratches are cleaned with clean water and then plastered.

Educational interventions have been proven to be able to improve students' knowledge as a whole. Health education in schools has a strategic role in shaping a safety-conscious generation. First aid knowledge is a basic skill that students must have. Schools as a learning environment are the right place for such interventions. Teachers and health workers can collaborate in providing education. This collaboration will strengthen students' understanding of the material. In addition, school support also affects the success of the program. Adequate facilities and facilities help the learning process. With a continuous education program, students' knowledge can be maintained. Therefore, educational interventions need to be carried out regularly.

The results of this study are in line with the theory of Notoatmodjo (2018) which states that knowledge can be improved through health education. Health education aims to increase the awareness and abilities of individuals. In this study, students are an important subject in injury prevention efforts. Good knowledge will form a positive

attitude towards safety. This positive attitude encourages appropriate action when an accident occurs. Effective education will result in a deep understanding.

According to First Aid in Accidents (P3K) is a very important initial measure to prevent the victim's condition from worsening before receiving medical treatment. In the school environment, accidents can occur anytime and anywhere, so students' readiness to provide help is needed. Unfortunately, there are still many who do not understand the P3K procedure correctly, so the actions taken can actually worsen the situation, good knowledge and the right skills in P3K are important aspects to improve quick and effective response in emergency situations. Knowledge is a key factor in shaping appropriate behavior, especially in emergency situations such as first aid. The learning process plays an important role in improving knowledge, which in turn affects the quality of actions. Lack of knowledge often leads to mismanagement, and can even be fatal for victims (Ni'ma, 2023)

The results of this study are in line with the research conducted by Prasetyo (2022) with the title The Influence of Health Education on the Knowledge Level of Grade XI Students about First Aid in Accidents at SMK Kesehatan Patriot 3 Bekasi. After being given education (post-test) there was an increase in the students' knowledge and 15 people (15%) experienced sufficient knowledge and there were 51 people (85%) experiencing a good level of knowledge, the instrumental evaluation of P3K education with good results was 60 people (100%) and for poor results there were no results.

Based on the results of the above research, the researcher concluded that the results of the study showed that educational interventions were very effective. The increase in first aid knowledge in student accidents is significant. This is evidenced by the high percentage of good categories. Health education in schools has been proven to have a positive impact. Good knowledge is the basis for safe behavior. Educated students are better prepared to deal with emergency situations.

### **Bivariate Analysis**

#### **The Effect of Health Education on Student Knowledge in First Aid Emergency Response to Accidents at SMPN 3 Limboto**

The results of the N statistical test are the number of samples used, namely 67 students, the mean value or average score before 21.45 and after 31.06 with a *mean value of difference* or the average difference between before and after the health education intervention is 9.61 while the SD score (*Standard Deviation*) before 2,590 and after 1,938 which shows that there is a change between before and after the intervention with a significant value or *Pvalue* obtained  $0.000 < 0.05$  which indicates that there is an influence of health education on the knowledge of female students in the emergency response of first aid to accidents at SMPN 3 Limboto.

The average value of students' knowledge before being given health education is 21.45. This value indicates that the level of knowledge of students is still in the category of lacking. Low initial scores can be due to a lack of information about first aid. Most students have never received health education in a structured manner before. This condition reflects the lack of health education programs in schools. After being given health education, the average value of student knowledge increased to 31.06. This increase shows a considerable change in knowledge. The health education provided is able to increase students' understanding of first aid.

The average difference in knowledge values before and after education was 9.61. This difference shows a significant increase quantitatively. A large *mean value of difference* indicates the effectiveness of the intervention. This change did not happen by chance, but as a result of the health education provided. Health education provides new information that students did not know before. The new knowledge enriches students' understanding of first aid.

The standard deviation value before health education was 2.590. This value indicates that the variation in students' knowledge before the intervention is quite large. The difference in knowledge level between students is quite diverse before education is provided. This can be influenced by the background and experience of each student. After health education, the standard deviation value decreased to 1.938. A decrease in standard deviation indicates that students' knowledge has become more evenly distributed. Health education helps to equalize students' understanding.

Accidents or emergency situations can occur and happen to anyone and anytime, anytime without prior warning, whether on the street, at home or even in the school environment. The accident, if not immediately helped, can threaten the victim's life. School students in particular are at risk of intentional injury because they are on their active hours and especially have breaks between lessons to play and refresh themselves after receiving lessons. Injuries can also occur during school sports events and when involved in extra-curricular activities organized by schools (Mutiarawati, 2025)

The provision of first aid in an accident must be quickly and appropriately using the facilities and infrastructure at the scene. First aid in an accident done correctly will reduce disability or suffering and even save the victim from death. However, if first aid measures in an accident are not carried out properly, it can even worsen the accident and even cause death (Widiastuti, 2021).

The lack of knowledge from the public, especially students, about providing first aid in accidents makes many sufferers experience delays in handling. The lack of knowledge in providing first aid in accidents can be overcome by providing education and training on first aid in accidents. Health education is an activity in learning

methods, especially for teachers. Education affects health behavior as a secondary outcome which will affect the increase in health indicators in individuals as outputs. According to Notoatmodjo (2017). Health Education is an effort to provide psychological conditions and targets for them to behave in accordance with the demands of health values.

The findings of this study are in line with the theory of health education which states that education can improve knowledge. According to Bloom's theory (2017), knowledge is a cognitive domain that can be improved through learning. Health education functions as a means of information transfer. An effective learning process is able to change an individual's level of knowledge. The results of this study are also in line with previous studies. Some studies have shown that health education improves first aid knowledge. The similarity of these results strengthens the validity of the study. Health education has proven to be effective in various educational settings. Schools are an ideal environment for health interventions. Thus, the results of this study support previous theories and research.

The results of this study are in line with the research conducted by Ayu Kartikasidkk (2022) with the title Providing first aid education in accidents (p3k) in increasing the knowledge and motivation of adolescent Red Cross members (PMR). The results showed that before the intervention, almost all of them had sufficient knowledge (25 people) and after the intervention had good knowledge of 100% (32 people). The motivation of PMR members before being given the intervention was almost entirely moderately motivated with a total of 87.5% (28 people) and motivation after being given the intervention of all respondents were highly motivated as much as 100% (32 people). The results of Wilcoxon's statistical test showed the effect of P3K education on knowledge ( $p=0.000$ ) and motivation ( $p=0.000$ ).

The results of this study are also supported by research conducted by Retno Lusmiati Anisah and Parmilah (2020) with the title First Aid Education in Accidents (P3K) for the Youth Red Cross (PMR) to Increase Readiness to Help Accident Victims. The results of the research are expected to be a reference for community nurses to develop nursing care in school areas, especially in increasing the readiness to help accident victims for PMR Wira members, with education about P3K on an ongoing basis.

The research was conducted by Anggun Pranessia Anggrasari and Denis Farida (2025) with the title The Influence of Health Education on Students' Knowledge of First Aid in Accidents (p3k) at School. The results of the research before being given education were obtained as many as 53% of students in the lack category, while after being given education 53% were in the category of sufficient knowledge. For the results of data analysis using the wilcoxon test, a  $p$  value of  $0.000 < 0.05$  was obtained, which means that there is an influence of health education on students' knowledge about P3K so that it is hoped that in the future material about P3K will be provided periodically and can minimize accident and emergency situations in the school environment.

Based on the results of the above research, the researcher concluded that health education has an effect on students' knowledge. The increase in the average score and the results of statistical tests support this conclusion. Health education has been proven to be effective in improving the understanding of first aid. Schools have an important role in the implementation of health education. Good knowledge can improve students' preparedness in dealing with accidents.

## CONCLUSION

1. First aid knowledge in student accidents before being given educational intervention at SMPN 3 Limboto is the highest in the adequate category of 58 people and the lowest is the good category of 9 people.
2. The knowledge of first aid in student accidents after being given educational intervention at SMPN 3 Limboto was the highest in the good category of 66 people and the lowest was in the sufficient category of 1 person.
3. There was an effect of health education on the knowledge of female students in emergency response to first aid in accidents at SMPN 3 Limboto with a *V* value =  $0.000 < 0.05$ .

## SUGGESTIONS

1. For Educational Institutions  
The results of this research can be used as a scientific development for junior high school students to know and be able to apply and simulate first aid at school.
2. For Teens  
The results of this study can increase adolescents' knowledge about first aid in accidents so that adolescents can anticipate and be able to perform first aid in accidents during emergency response time.
3. For Nursing Education  
The results of this research can be used as a source of information, reference materials and one of the reading materials in conducting first aid to handle injured victims.
4. For the Next Researcher  
The results of this study can be a reference material and comparative material to conduct further research on first aid in accidents during emergency response time in students by using different interventions such as providing training to students on first aid in accidents and applying p3k such as applying the p3k step when

slightly injured to students, analyzing the causes of accidents at school by involving students, Compile and combine (synthesize) simple accident handling plans in schools together, conduct evaluations by assessing the accuracy of the P3K carried out. So that the researcher can then measure the skills and motor level of the students directly through observation or simulation of first aid practice.

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