

## Application of the PRICE Method in Handling Acute Injuries and Trauma Among Karangpandan Volunteers

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### Abstract

*Acute injuries or acute trauma often occur as a result of accidents on the road or due to other activities such as exercising or working. Acute injuries require immediate attention to avoid complications and increase the victim's comfort. One method of acute trauma relief is PRICE (protection, rest, ice, compression, elevation). Karangpandan volunteers are a self-dedicated group working independently on their own initiative to help the community. Knowledge and skills in handling injuries are important things that they must master. The implementation method is in the form of training activities on PRICE, demonstrating skills in using the PRICE method in everyday injury management. This activity involved 24 volunteers from Karangpandan Volunteers. The method of assessing knowledge and skills uses a questionnaire and checklist sheet, each containing 10 question/observation items. The results of the activity show an increase in knowledge and skills regarding the use of the PRICE method by volunteers.*

**Keywords:** Price, Volunteers, Knowledge, Skills

### Introduction

Emergency in health services is a clinical condition of a patient that requires immediate medical attention to save lives and prevent disability (Mustafa & Nisar, 2023). Emergency is a clinical condition of a patient that requires immediate medical attention. Emergency in general is a condition in which the patient needs help quickly, accurately, and responsively to prevent disability and death. The need for medical

attention is what makes emergency conditions very important to get attention. Emergency medical conditions in the community require immediate access so that medical attention can be given immediately.

Efforts to reduce the negative impact of emergency cases are by providing emergency assistance. Emergency assistance must be carried out quickly, accurately, and responsively to prevent death and disability. The principle of emergency patient care is that time is life (Prahmawati et al., 2021) . Medical emergency conditions can be caused by various things such as illness, traffic accidents or disaster situations. Emergency conditions in the community like this need to be facilitated so that their safety is guaranteed. According to the World Health Organization (WHO) in 2017, there were 95,906 accidents and around 17.2% were fatalities due to accident incidents and around 1.3 million people experienced physical disabilities. In 2017, WHO recorded that traffic accidents claimed the lives of around 2.4 million people. Currently, many areas in Indonesia, including the Karangpandan Karanganyar Region, have volunteers who facilitate the community's need for access to health. Karangpandan Volunteers (Rendan) are volunteers who are an independent community initiative to help the community in disasters, accident emergencies and providing ambulance transportation for people experiencing medical problems or injuries in the Karangpandan area.

Acute injuries or acute trauma often occur due to road accidents or other activities such as sports or work. Acute injuries must receive immediate help to avoid complications and improve victim comfort. One method of acute trauma assistance is PRICE (protection, rest, ice, compression, elevate) (Kurniati et al., 2022) . This method is for handling injuries with emergency management that aims to prevent further injury and reduce pain. PRICE stands for Protection, Rest, Ice, Compression and Elevation. In a study, the PRICE method was effective for handling ankle injuries (Ankle sprain) grade 1 and grade 2 (Erdurmuş et al., 2023), (Patra et al., 2018)

Based on Health Research data the percentage of injuries in Indonesia is 9.2% with the proportion of body parts affected by lower limb injuries 67.9% (Saputri et al., 2020). Physical injury generally can be defined as any stress on the body that prevents the organism from

functioning properly and results in the body employing a process of repair (Walker, 2018) . Injury is a disorder that occurs in the body that results in pain, heat, redness, swelling, and inability to function properly in muscles, tendons, ligaments, joints, and bones due to excessive movement activities or accidents (Triyani & Ramdani, 2020)

Injuries can be experienced by anyone who does heavy and excessive activities or body movement errors when doing daily activities or at work. The factors that cause injuries are: (1) internal factors including physical condition, excessive load, incorrect movement coordination, muscle imbalance, body posture (malalignment), lack of warm-up, (2) external factors including sports facilities and infrastructure, and sports that have elements of body contact and (3) overuse due to excessive muscle use. Handling injuries in the early stages is very significant in its function as a determining factor in the length of the healing process for patients who experience the injury. If there is an incorrect first aid action, it will result in a long healing process for the injury. Early management of injuries can be done using the PRICE method.

The PRICES action is an injury handling action in which each component has its own role and has a different function so that they complement each other for handling injuries that occur, however, when observing several volunteers, they still did not know enough about early treatment of injuries using the PRICES method. (Susanti & Sari, 2017) . To improve knowledge and skills about first aid for traumatic or injuries, using the prices (protect, rest, ice, compression, elevation, and support) handling method. The prices method is usually used in cases of sprains and strains. Prices should not be used on muscle cramps, open fractures, open wounds to the skin, and victims who are allergic to cold. Things that need to be considered in handling injuries according to (Versloot et al., 2020) in the first 24-48 hours after the injury, you should not massage or heat the injured part because it can aggravate the injury. Handling using the principle of prices can provide fast, precise, and safe early treatment of inflammatory reactions in injuries (Sutriawan et al., 2023).

Protection, the first thing to do is to protect the injured area. Do not let more serious injuries occur. In some cases, for example, a sprained or dislocated ankle, choose shoes that can elevate and support the foot. Or you can use a brace to protect it. 2) Rest, If you have been injured, you should stop all activities that caused the injury. Rest the affected limb. In addition, patients can also use crutches as an aid while resting the injured leg (Domenic & Swartzendruber, 2020) 3) Ice (Ice Application) Inflammation is hot and causes swelling so it needs cooling to reduce the inflammation. Avoid using balm because it gets hotter, so you should apply ice wrapped in plastic or a clean cloth right on the injured area. This ice application should be done for five minutes every 4 hours (Tittley et al., 2020). 4) Compression (Pressing) This pressing method should be done gently on the injured area, do not massage it because the surrounding area will experience trauma. And do not pull, just press gently and slowly. 5) Elevation (Lifting) In this condition, the injured organ must be lifted in a position higher than the heart so that the swelling that appears immediately disappears. If the injury is in the leg, hang the leg on the wall so that the swelling heals quickly (Doherty et al., 2017) .

The many cases often faced by volunteers require ambulance volunteers to have sufficient knowledge and skills to be able to provide the most appropriate assistance to the community. Good knowledge will be the basis for them in providing assistance. The PRICE method is a simple method that is very useful in handling injuries. With this method, volunteers will be faster in providing assistance and then taking them to the appropriate referral place.

## **Method**

This community service activity uses an Asset Based Community Development approach. Karangpandan volunteers have various potential strengths so they are empowered in society. This potential includes a solid and large number of members, motivation and desire to continue to develop, knowledge, skills and equipment that support their activities in carrying out their work to help the community. The implementation method was in workshops and training on PRICE and skills in using the PRICE method in handling

daily injuries. This activity involved 3 lecturers, 2 students and 24 volunteers from Rendan. Assessment of knowledge on the PRICE method used a questionnaire containing 10 questions given 2 times before and after training. Assessment of skills using a checklist containing 10 assessment items.

## **Results**

### **Knowledge of the PRICE Method**

PRICE (Protection, Rest, Ice, Compression, Elevation), is a simple method in first aid for injury incidents. Knowledge is the result of remembering something, including remembering events that have been experienced intentionally or unintentionally and this occurs after people make contact or observe a particular object. Behavior that is based on knowledge will be more lasting than behavior that is not based on knowledge, because the behavior occurs due to coercion or rules that require action (Wahyuni, 2022) . Volunteers' knowledge of PRICE before and after training can be seen in the following table:

Table 1. Knowledge of the PRICE method in handling injuries

	Before Training		After Training	
	Frequency	Percentage	Frequency	Percentage
	(f)	(%)	(f)	(%)
PRICE method knowledge				
Low	16	66.6	1	4.2
Fair	6	25	2	8.3
High	2	8.4	21	87.5
Total	24	100	24	100

Based on the table above, most respondents had a low range of knowledge before training, which was around 66.6 %. After training and education activities, 87.5 % of respondents experienced an increase in knowledge in the high range.

### **Injury management skills with the PRICE method**

The behavior of volunteers in handling injuries can be seen from their skills in demonstrating several actions in the PRICE

components such as protecting the injured area, resting the injured area, compressing with ice around the injured area, applying elastic bandages to apply pressure to the injured area and raising the injured area above the victim's heart level. The results of the volunteers' skills can be seen in the following table:

Table 2. Skill of the PRICE method in handling injuries

	Before Training		After Training	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
PRICE method skills				
Poor	15	62.5	2	8.3
Enough	5	20.8	2	8.3
Good	4	16.7	20	83.4
Total	24	100	24	100

Based on table 2 above, information was obtained that before and after education and training there was an increase in skills in handling injuries using the PRICE method, before training the respondent skill was in poor range of 62.5% increasing to 83.4% having a good range of skills after the training program.

**Discussion**

Based on table 1, it is obtained that the volunteers' knowledge about handling injuries using the PRICE method is included in the low criteria. Many factors affect a person's level of knowledge, some of which are:

Experience, a person's experience of something will affect the level of a person's knowledge, ideally the more experience will have more knowledge too. Experience as a source of knowledge is a way to obtain the truth of knowledge obtained by solving the problems faced. Learning experiences during work will be able to develop decision-making skills which are manifestations of the integration of scientific

and ethical reasoning that departs from real problems according to the field of work.

Education is a process to develop all the abilities and behaviors of a person that occurs through teaching. Education is one of the factors that influences a person's knowledge because it can make it easier to accept new ideas or technologies in anticipating the level of community needs that increasingly demand quality. Rapid changes in the development of science and technology are in great need of good knowledge obtained from the process during education. The level of education is a factor that influences a person's perception to receive better information. Education is an effort to develop personality, abilities inside and outside of school and lasts a lifetime. The higher a person's education, the easier it is for that person to receive information. With higher education, a person receives information both from other people and from the mass media, the more information that comes in, the more knowledge a person has about health (Alpaydin et al., 2022)

Media, is a source of information where someone can get new knowledge in a field. The more advanced and developed the media will make it easier for someone to be exposed to and access some information including in handling injuries with the PRICE method. Print media, social media, electronic media greatly help the public get information widely with a greater reach. These media are very interesting and in accordance with current technological developments.

The PRICE method in handling injuries is very effective for some cases of injury. Based on several questionnaire results, many respondents still think that the use of protective equipment in the injured area must use equipment sold by the manufacturer. In reality, in providing assistance, especially when providing protection, someone can use available tools such as wooden boards, plastic or anything that is important to function like the function of the manufacturer's tools in general. If the injury occurs on the street or in risky places, move it immediately if possible using tools such as stretchers, crutches or other tools. This protection is carried out to prevent further injury (Starling, 2024)

Rest, evidence regarding the use of rest comes from research on the effects of immobilization on muscle injuries. Short-term immobilization is beneficial, but longer-term immobilization or rest is not recommended. Long-term rest will allow scar tissue to connect the injured muscle base. By limiting the duration of immobilization to less than a week, the adverse effects of immobility can be minimized. The meaning of rest is to reduce activities that are too heavy on injured muscle tissue such as lifting excessive weights, running and others.

Many respondents also think that using ice on the injured area is not good, even though ice is very helpful in reducing capillary dilation activity due to trauma. Cold temperatures can reduce bleeding and can reduce pain. Ice therapy, also known as cryotherapy where ice is able to reduce metabolic activity in injured tissue, causes vasoconstriction of blood vessels. This physiological change slows and prevents further swelling. The use of ice also reduces the propagation of nociceptive nerve stimuli to the brain which can reduce pain and muscle stiffness. It is important to note that long-term use of cryotherapy can interfere with the wound healing process. Muscle and tissue damage can occur if blood flow is reduced excessively and the risk of nerve damage increases if ice is used for a long period of time. The most effective application of ice is every 10 minutes then without ice for 10 minutes alternately (Knott et al., 2024) . The use of cryotherapy in people who are hypersensitive to cold should be avoided (eg Raynaud's syndrome, diabetes, cold urticaria, paroxysmal cold hemoglobulinuria) and someone who has circulatory disorders. Ice is not applied directly, but is wrapped in cloth or other wrapping so as not to cause damage to nerves and skin tissue.

A somewhat different opinion was expressed by (Bayer et al., 2019) highlighting the lack of concrete evidence showing the efficacy of ice in promoting tissue repair. The tolerability of ICE therapy by patients suggests that it is generally well accepted and can provide symptomatic relief, such as pain reduction and swelling control. However, there is still little evidence regarding its actual impact on the underlying healing process. In other words, although this therapy is widely practiced and acceptable for some injured people, its effectiveness in promoting tissue repair is still uncertain and not supported by scientific evidence.



Compression serves to prevent further Edema (swelling) due to the inflammatory process and also reduces bleeding at the site of tissue injury. Elastic bandages should be used to provide comfortable compression strength without causing pain or pressing on blood vessels. The use of bandages should start from the end of the injured area to the base. This can also serve to provide protection to the injured body part from excessive movement, although this is not its main purpose.

Elevation, Elevation of the injured limb will prevent swelling by increasing venous return to the systemic circulation, and reducing hydrostatic pressure, thereby reducing edema and assisting waste removal from the injury site. Elevation of the injured limb above the level of the heart is commonly recommended as part of the protocol for managing acute injuries. However, the lack of high-quality randomized trials suggests that the effectiveness of elevation may not be known for certain or supported by strong scientific evidence. Although elevation is generally considered a safe and non-invasive intervention, its efficacy may vary depending on the injury or condition of the person (Bekerom et al., 2012)

Skills in handling injuries using the PRICE method increased significantly after training. Before training, the majority of volunteers had skills in using the PRICE method in the range of less than 62.5 % , after training, 83.4 volunteers had good skills in using the PRICE method. The methods used during training are visual and demonstration. The demonstration method is a learning model by demonstrating or showing a particular object being studied, either real or imitation, which is often accompanied by an oral explanation to the audience. With the demonstration method, the process of students accepting the lesson will be more memorable in depth, so that it forms a good and perfect understanding. Also, students can observe and pay attention to what is shown during the lesson. The demonstration method is an effective way to improve students' active learning. In this method, the teacher shows students how to do something, not just telling them about it (Bhidju, 2020)

Demonstration learning involves the speaker giving a demonstration, and students are actively involved in the learning process. In this learning, students see and listen to the speaker showing how to do something, then students can try it themselves or do similar tasks with guidance from the teacher or speaker. The demonstration method allows students to see, try, and practice the concepts or skills being taught directly, thereby strengthening their understanding and learning experience. Compared to conventional methods, the demonstration method emphasizes more on practical experience and skills. In comparison, traditional learning emphasizes more on theory and conceptual knowledge. This method is more collaborative and facilitates interactive learning.

Demonstration methods are very useful in improving learning, especially skills in the health sector. Audiences who see demonstrations are more likely to be involved in the material being studied. They can see how the theory being studied is applied in practice, making it easier to understand and remember the material. Audiences who watch demonstrations are invited to think critically about what they see. This encourages deeper understanding. Seeing a demonstration can help the audience feel more confident in their ability to do a task. They can see how to do the task correctly and then try it themselves with guidance from the speaker. Demonstrations can be used to introduce hands-on activities, further enhancing active learning. Audiences can work in groups to practice what they have seen in the demonstration. Demonstrations provide visual aids that can help someone understand the material better. The demonstration method is an effective way to improve learning, this method can help improve understanding of the material better.

Demonstration of injury handling using PRICE method on Karangpandan Volunteers greatly helped the volunteers in understanding and taking action starting from installing protective equipment such as splints, how to give rest, how to compress ice, install elastic bandage and how to elevate the injured area. Volunteers played an active role in interactive discussions and also demonstrated actions as taught by the trainer.

## **Conclusions and Suggestions**

### **Conclusion**

In training activities, the use of the PRICE method in treating acute injuries by volunteers showed good results. 'The volunteers' knowledge and skills regarding the PRICE method increased after the training. Training using visual aids and demonstration techniques is effective in increasing the knowledge and skills of volunteers.

### **Suggestion**

Knowledge is not permanent, volunteers must always update information about handling acute injury cases that occur in the community. Volunteers must also frequently practice skills in providing assistance together with other volunteer teams or with other groups.

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