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ORIGINAL ARTICLE

The Effect Of PRICES Education On First Aid Skills For Sprain Injuries Among Youth Red Cross Members At High School

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ABSTRACT

Introduction: *Injury is damage to muscles, ligaments, or joints due to impact or excessive physical activity that can cause pain and swelling. One of the injuries that often occurs in teenagers during sports is a sprain. Therefore, teenage Red Cross members have an important role in providing first aid. However, the skills in handling sprains among teenage Red Cross members still need to be improved through proper education and training.* ***Objectives:*** *to determine the effect of PRICES education on first aid skills for sprain injuries in PMR at SMA Negeri 1 Gemolong.* ***Methods:*** *This study used a one group pretest – posttest design. In this study, members of PMR SMA Negeri 1 Gemolong were given a pretest to measure their skills in handling a sprain injury using the PRICES method before the treatment, and after receiving the treatment.* ***Results:*** *All respondents (100%) experienced an increase in skills without any decrease or stable values. The Wilcoxon test results showed a p value of 0.000 (p < 0.05), so H0 is rejected and Ha is accepted.* ***Conclusions:*** *First aid education for sprain injuries using the PRICES method has been proven to have a significant effect in improving the skills of Youth Red Cross members. After being educated, all respondents showed an increase in skills without any decrease or stable values. These findings emphasize that the PRICES method is effective as a practice-based educational approach to enhance preparedness and first aid skills for sprain injuries in the school environment.*

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Introduction

An injury is a condition in which the body experiences physical disturbance or damage, such as bruises, sprains, or dislocations of muscles and joints, which usually occur as a result of impact, pressure, or intense physical activity, causing a decline in the function of muscles, bones, and joints (Athoillah et al., 2024). This is characterized by the onset of inflammation as the body's response, including the five classic signs: Rubor, Calor, Tumor, Dolor, and Fuctio Leasa (Mustafa, 2022). Intense physical activity is a factor that increases the risk of sprains and strains. Every individual should possess first-aid knowledge to be able to provide quick and appropriate initial treatment during a medical emergency (Alfarisi et al., 2022; Damayanti et al., 2022).

A sprain is a type of injury that often occurs during strenuous physical activity, causing a ligament—the connective tissue that connects bones and the joint capsule to maintain joint stability—to stretch or tear (Damayanti et al., 2022). A ligament injury occurs when the tissue supporting the joint is stretched beyond its normal range of motion, causing swelling and pain in the injured area (Mustafa, 2022).

Sprains are the most common type of injury worldwide; a study in the United States found that approximately 2 million people suffer from sprains each year (Medicine, 2019). A sprain is

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damage to a ligament that causes joint instability; symptoms may include pain and inflammation (Athoillah et al., 2024). According to the Basic Health Research (RISKESDAS), the injury incidence rate in Indonesia is 9.20%. Injury incidence figures in Central Java Province indicate that injuries can negatively impact a person's ability to perform daily activities at a rate of 9.30%, while in Sragen the rate is 7.07% (RISKESDAS, 2018). According to the Office of Disease Prevention and Health Promotion, each year, more than 1 million cases of sports-related injuries occur in school settings among children and adolescents aged 10–18 years, making injuries a common health issue (Wibowo et al., 2024).

The risk of injury in school settings, caused by high levels of physical activity and unpredictable environments, can increase the likelihood of injuries or accidents (Muchtar et al., 2024). Prompt first aid administered according to proper procedures plays a crucial role in accelerating recovery and reducing the risk of further injury. These measures can prevent injuries from worsening, reduce pain and swelling, and accelerate the healing of damaged tissue (Widhiyanti et al., 2024). Nonpharmacological management of sprains is carried out using the Protect, Rest, Ice, Compression, Evaluation, Support (PRICES) method (Shela et al., 2025).

This study aimed to determine the effect of education on the PRICES method on first aid skills for sprains among members of the PMR at Gemolong State Senior High School 1. This study was conducted by measuring the respondents' skills before and after they received education using the PRICES method. The results of these measurements were used to determine changes in skills following the intervention.

Methods

This study employed a quantitative method with a quasi-experimental design using a one-group pretest–posttest design without a control group. This design was chosen because the study aimed to determine changes in the skills of PMR members at Gemolong State High School 1 in managing sprain injuries using the PRICES method before and after the intervention. The study began with a pretest to measure skill levels. Next, the PMR members received an intervention on treating sprains using the PRICES method, followed by a posttest to measure their skills after the intervention. The results of the pre- and post-intervention assessments were compared to determine changes in skill levels.

First aid skills for treating sprains were measured using an observation sheet whose validity had been tested through expert review and whose reliability had been tested using the kappa coefficient, yielding a value of 0.963. These results indicate that the instrument used exhibits excellent assessment consistency, making it suitable for measuring the respondents' skills. The intervention consisted of education using PowerPoint (PPT) presentations accompanied by demonstrations of sprain management. The study was conducted among PMR members at Gemolong State High School 1 using total sampling.

The sampling technique used in this study was total sampling. The study involved one treatment group without a control group, with the intervention consisting of education on sprain management using the PRICES method. The respondents' skills were measured using pre-test and post-test observation sheets. Inclusion criteria included PMR members who had never received education on sprains and were willing to participate as respondents, while exclusion criteria included members who did not complete the study, were ill, or had mental or physical limitations. Of the 45 initial respondents, 5 met the exclusion criteria: 3 were absent due to other organizational activities at the same time, and 2 left before the activity ended. Consequently, a total of 40 participants were analyzed in this study.

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Results

The study results from the 40 participants are presented in the form of univariate and bivariate analyses. The collected data were then processed and presented in tables along with explanations to facilitate understanding of the study results.

Tabel 1. Respondent Characteristics (n=40).

Respondent Characteristics	Frequency (f)	Percentage %
Age		
14 Years	0	0
15 Years	14	35,0
16 Years	26	65,0
Total	**40**	**100**
Jenis Kelamin		
Man	13	32,5
Women	27	67,5
Total	**40**	**100**

In Table 1, the results of the frequency analysis show that the majority of respondents were in the 16-year-old age group, namely 26 respondents (65.0%) out of a total of 40 respondents. Based on gender, the majority of respondents were female, totaling 27 respondents (67.5%).

Tabel 2. Skill levels of PMR members at Gemolong State High School 1 in providing first aid for sprains before receiving education using the PRICES method (n=40).

Skill Level	Frequency (f)	Percentage %
Skilled	0	0
Fairly Skilled	22	55,0
Less Skilled	18	45,0
Total	**40**	**100**

Based on the pretest results presented in Table 2, it was found that before receiving education, the majority of respondents fell into the “fairly skilled” category, namely 22 respondents (55.0%).

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Tabel 3. Skill levels of PMR members at Gemolong State High School 1 in providing first aid for sprains after receiving education using the PRICES method (n=40).

Skill Level	Frequency (f)	Percentage %
Skilled	27	67,5
Fairly Skilled	13	32,5
Less Skilled	0	0
Total	**40**	**100**

After the intervention, as shown in Table 3 above, the posttest results of the 40 respondents indicated an improvement in skills. The majority were at the "skilled" level, with 27 respondents (67.5%).

Tabel 4. Wilcoxon Test Analysis (n=40).

		Z	p-value
Postest-Pretest	Skills Before the Intervention (n=40) Skills After Intervention (n=40)	-5.515	,000

Based on the results of the Wilcoxon test, a p-value of 0.000 ($p < 0.05$) was obtained, indicating a significant difference between skills before and after the intervention. Therefore, H0 is rejected and Ha is accepted, meaning there is a difference between the values before and after the intervention. Thus, it is concluded that the PRICES education program has an effect on first aid skills for sprains among PMR students at Gemolong State Senior High School 1.

Discussion

Distribusi Responden

Based on the results of the study involving 40 respondents, the age range of the respondents was 15–16 years. The majority of respondents were 16 years old, totaling 26 individuals (65.0%). Meanwhile, there were 14 respondents (35.0%) who were 15 years old. Adolescence is a transitional phase toward adulthood, making it an ideal period to enhance knowledge and skills in managing sprain injuries.

This aligns with the theory that adolescence is a crucial transitional phase marked by the shift from childhood to adulthood. For middle adolescents aged 15–17 years, their thinking begins to mature, although peer influence remains quite strong. At this age, adolescents also begin to learn independence, regulate their behavior, and plan their life goals. These developments indicate that increasing age plays a role in enhancing an individual's thinking abilities, skills, and knowledge, particularly in cognitive aspects (Nataliya & Tambunan, 2024; Sulhan et al., 2024; Suparmanto et al., 2022).

According to cognitive development theory, adolescence is characterized by an increase in thinking abilities. Piaget explains that adolescents begin to understand their environment through more complex thought processes. This phase is also marked by adolescent egocentrism, such as feeling that others are paying attention to them and perceiving themselves as different or more invulnerable. In addition, decision-making and critical thinking skills also continue to develop (Irola & Kalifia, 2024). It can be concluded that adolescents possess excellent cognitive abilities and are capable of participating effectively. This enables them to acquire information more easily and comprehend health education materials relevant to their field.

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The majority of respondents were female, with 27 respondents (67.5%). This indicates that the PMR extracurricular group is predominantly composed of female members compared to male members.

This aligns with the research byet al Fian et al., (2025); Rosyad et al., (2025), which found that male interest in joining organizations within the school environment—particularly in the PMR—is very low, with some perceiving the PMR as an activity that is not very "gentlemanly."

This finding is also supported by a study by Ramadhani et al., (2025) at the PMR club at Banyudono State High School No. 1, which showed that the majority of members were female (79.1%) and 20.9% were male. It was concluded that, on average, PMR clubs generally have more female members than male members.

Skill levels prior to the PRICES method training.

Of the 40 respondents before the education session, the majority fell into the "fairly skilled" category, totaling 22 respondents (55.0%), while 18 respondents (45.0%) were in the "less skilled" category. Based on this, it was found that several PMR members at Gemolong State High School 1 possessed "fairly skilled" proficiency when performing first aid for injuries, as evidenced by their work efficiency and composure. Those predominantly in the "fairly skilled" category were senior PMR members at Gemolong State High School 1; therefore, they already possessed a different level of knowledge compared to their juniors.

Based on the research results, during the pretest phase before the PRICES method was taught, the respondents' first aid skills were still suboptimal. The steps most frequently overlooked include the orientation phase, the communication of the follow-up plan (RTL), the demeanor during the procedure, and the elevation component. Some respondents immediately performed the procedure without explaining it to the victim, even though initial communication is crucial for calming the victim and building their trust during the first aid process (Syaripudin & Mulyadi, 2024).

Furthermore, the elevation component is still often not performed correctly; elevation involves raising the injured area so that it is higher than the heart, which plays a crucial role in reducing swelling. A lack of understanding regarding the stages of communication, assessment, and injury management can affect responders' preparedness and accuracy in providing first aid for sprains (Kresna & Aldhany, 2026; Setyawan et al., 2026; Wibowo et al., 2024; Wilson, 2023).

Based on the data obtained, pre-intervention skills were predominantly categorized as "fairly skilled." This differs from previous studies, which reported that respondents were still relatively unskilled. This discrepancy is likely influenced by respondent characteristics, research methods, and variations in knowledge, experience, and training among individuals (Athoillah et al., 2024; Fian et al., 2025; Shela et al., 2025).

These findings align with the views Jufriadi et al., (2022), who state that skill is the ability to perform actions quickly and precisely so that procedures can be carried out accurately and efficiently. Skill is also influenced by knowledge—that is, all the information a person possesses and stores in memory regarding a particular object.

Based on the researchers' assumptions, the majority of respondents were considered moderately skilled in administering first aid prior to the intervention; however, challenges persisted with specific indicators—such as the elevation procedure—due to limited technical knowledge regarding that procedure. This situation indicates that skill reflects a person's ability to make and carry out the appropriate actions within a relatively short time, which is highly dependent on the accumulation of knowledge and experience stored in an individual's memory.

Skill levels prior to PRICES method education.

Of the 40 respondents after the education session, 22 (55.0%) were classified as skilled, while 18 (45.0%) were classified as moderately skilled. These findings indicate an improvement in the respondents' skills in managing sprain injuries following the education session.

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Pretest results for the 40 respondents regarding first aid for sprains using the PRICES method showed that the most frequently overlooked steps included the orientation phase, the termination phase, performance during the procedure, and the elevation component. After receiving education, the respondents' skills improved significantly. However, there were still some respondents who were not yet optimal in performing the termination phase, particularly in communicating the follow-up plan after first aid was provided. The findings of this study align with those of a study by Suparmanto et al., (2022), which demonstrated that health education on first aid for sprains effectively improves knowledge and skills.

The study results show that after the intervention, the majority of respondents fell into the "skilled" category. This is consistent with previous research indicating that the majority of respondents demonstrated improved skills and reached the "skilled" category on the posttest. These results indicate that the intervention was effective in enhancing the respondents' skills (Athoillah et al., 2024; Fian et al., 2025; Shela et al., 2025).

Armed with basic first aid knowledge, PMR members' skills develop through a process of continuous learning and training. This training helps improve their comprehension, mindset, and readiness to handle injuries appropriately. With good skills, PMR members are able to provide initial aid according to standards, help others, and reduce the risk of more serious injuries. Skills themselves are the practical application of one's knowledge in taking swift and appropriate action (Fian et al., 2025; Shela et al., 2025; Wibowo et al., 2024).

Simply put, a skill is a person's ability to perform an action well, quickly, and accurately. Skills develop through continuous practice or training. In first aid, a skill refers to the ability to provide appropriate initial care to prevent a condition from worsening. This ability is formed through a learning process supported by various (Setiawan et al., 2023; Surantara, 2023).

The use of various educational tools has been proven to effectively develop skills and promote long-term memory retention. This is because the information received is systematically stored in memory. With diverse media, individuals can more easily understand and optimally practice new skills (Fernando et al., 2025; Maghfiroh et al., 2023).

The researchers concluded that education and demonstrations effectively and significantly improved the technical skills of the first responders. The use of varied learning media helped reinforce understanding and knowledge retention, enabling them to apply these skills in quick and appropriate actions. PMR members who already had a foundation in first aid demonstrated improved skills, particularly in the aspect of elevation, which they had previously struggled with. This finding indicates that continuous education can foster the transformation of theoretical knowledge into practical skills in accordance with established procedures, enabling PMR members to respond more effectively to injuries within the school environment.

The Effect of PRICES Method Education on Skills in Treating Sports Sprains

The research results, based on the Wilcoxon test, showed that all respondents demonstrated an increase in posttest scores compared to pretest scores, with no decreases or unchanged scores. A p-value of 0.000 ($p < 0.05$) confirms that the PRICES education program has an effect on first aid skills for treating sprains among PMR members at Gemolong State High School 1.

This confirms that providing education and hands-on practice is highly effective in improving the respondents' skills. With a p-value of 0.000 ($p < 0.05$), the results confirm that the PRICES education program has an effect on first aid skills for sprains among the PMR members at Gemolong State Senior High School 1. These findings are consistent with the studies by Athoillah et al., (2024) dan Suparmanto et al., (2022), which also showed p-values < 0.05. Therefore, it can be concluded that the alternative hypothesis H1 is accepted and that there is a significant effect of the intervention provided.

A person's attitudes can change through effective communication. One approach is through education, which serves as a means of conveying information to influence and shape more positive attitudes. Information presented through engaging media is more easily understood and

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accepted by individuals. This can help improve cognitive, affective, and psychomotor aspects, thereby encouraging individuals to adopt better behaviors. Skills develop through the process of receiving and processing information obtained through the five senses. Most information is received through the senses of sight and hearing, as these two senses play a crucial role in capturing and processing stimuli from the environment (Maghfiroh et al., 2023; Nastiti et al., 2023).

In the visual process, light enters through the cornea and lens, is projected onto the retina, and is then transmitted to the brain as visual information. Meanwhile, in the auditory process, sound waves are converted into electrical signals in the inner ear and sent to the brain to be interpreted; thus, both play a crucial role in receiving information and supporting communication (Ananda et al., 2024; Arini et al., 2025; Hajar et al., 2022; Kartika et al., 2024; Ratnaningsih et al., 2023).

Skill development is an active process of behavioral change, achieved not only through the transmission of theory but also through an individual's motivation to learn. A skill is the ability to perform an action effectively as an application of one's knowledge. This ability is influenced by education, age, experience, and motivation, and develops through repeated practice (Aji et al., 2023; Fian et al., 2025; Maghfiroh et al., 2023).

The researchers hypothesize that health education—specifically through first-aid training for sprains—is the process of applying theoretical knowledge to practical actions that individuals can perform before medical assistance arrives. This is crucial because sprains, which frequently occur in the wrists or ankles, require prompt treatment to prevent the injury from worsening, such as swelling or tissue damage. Based on the results of the study, it was proven that health education through this program has a significant impact on improving skills in treating sprains among members of the Red Cross Youth (PMR) at Gemolong State High School 1.

Conclusion

Based on the results of the study conducted regarding the impact of the PRICES method on first aid skills for sprains among members of the Red Cross Youth (PMR) at Gemolong State High School 1, the following conclusions can be drawn.

Based on the research results, the majority of respondents were 16 years old (26 respondents, 65.0%), and the majority were female (27 respondents, 67.5%). Before receiving the PRICES method education, the skill level of the majority fell into the "fairly skilled" category, comprising 22 respondents (55.0%). After receiving the PRICES educational intervention through demonstrations, the respondents' skills improved, with the majority—27 respondents (65.5%)—falling into the "skilled" category. The analysis results showed that PRICES method education had a significant effect on first aid skills for sprains. This was evidenced by a p-value of 0.000 ($p < 0.05$), indicating that the education provided was effective in improving the respondents' skills.

Ethics approval and consent to participate

Prior to the study, an ethics review was conducted, and the results indicated that this study is ethically sound at Kusuma Husada University, Surakarta, No. 3075/UKH.L.02/EC/XII/2025. The study was conducted on January 9, 2026

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