

One-Day Youth Red Cross Camp: Training High School Students in Splinting Techniques for School-Based Trauma Response

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Abstract Introduction: Emergencies resulting from accidents can occur in any setting, including schools. In Indonesia, the overall injury prevalence has been reported at 9.2%, with schools accounting for the second-highest setting for injuries (8.4%). Splinting is a core first-aid technique that helps stabilize suspected fractures and prevent further injury or complications. This community service program aimed to improve the knowledge and practical splinting skills of Youth Red Cross (PMR) members at SMA Negeri 1 Sungai Raya. Methods: A training-based intervention was delivered in a one-day camp format using lectures, demonstrations, and supervised hands-on practice. Training effectiveness was evaluated using pre- and post-tests to assess knowledge gains and structured observation during skills practice to assess performance. Results and Conclusion: Students' knowledge increased substantially, as reflected by an improvement in mean test scores from 56.78 (pre-test) to 92.96 (post-test). Participants also demonstrated better adherence to correct splinting procedures during practice sessions. Overall, demonstration-centered training was effective for improving adolescents' understanding and practical competency in splinting.

1. INTRODUCTION

An emergency is a condition in which an individual or group requires immediate assistance; without prompt care, the situation may result in death or permanent disability (Iswari, 2019). Accident-related emergencies can occur at any time and in any setting, including schools (Hasibuan & Usiono, 2023). In Indonesia, the prevalence of injuries is 9.2%, with abrasions and contusions among the most common types (Risikesdas Team, 2018). Injury prevalence is highest among individuals aged 15–24 years (12.2%), and schools represent the second most frequent setting for injury events (8.4%) (Risikesdas Team, 2018). Because students routinely engage in play, skill-based activities, and sports, the school environment presents substantial risk for injury (Nastiti et al., 2023).

School emergencies vary widely, ranging from slips and

falls that cause cuts or bruises to choking, fainting, food poisoning, and other incidents (Hafsa et al., 2021). These events may occur while traveling to school, during school hours, or on the way home and may require immediate first aid and further medical care (Yunus et al., 2023). However, injuries sometimes occur in locations or situations where health professionals are not immediately available. In such cases, timely assistance from trained community members is crucial to support victims before professional care is accessible (Yulanda et al., 2023).

Within schools, Youth Red Cross (*Palang Merah Remaja/PMR*) members commonly serve as first responders for basic first aid. PMR is a student organization conducted through school-based extracurricular programs (PMI Jabar, 2023). One of PMR's Tri Bhakti components is developing

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healthy-living skills, which includes learning and applying appropriate first aid practices for injured students (Wahyuningtyas & Handayani, 2019). Early and appropriate first aid in school settings can reduce complications, lower treatment costs, and decrease the risk of severe outcomes. Therefore, targeted educational interventions are needed to strengthen PMR members' readiness to respond to injuries.

A preliminary assessment conducted by the Community Service team at SMA Negeri 1 Sungai Raya found that PMR members had previously received first aid education for injured victims but had not practiced rescue measures using splinting techniques. This gap is important because musculoskeletal injuries, particularly suspected fractures, require proper immobilization to prevent worsening tissue damage and delayed recovery. Splinting is a core first aid skill that stabilizes injured extremities, reduces pain, and helps prevent further injury. Nonetheless, school-based first aid teams, including PMR members, may have limited opportunities for structured, hands-on splinting practice.

Evidence suggests that early immobilization using correct splinting techniques can improve emergency response capacity and support better outcomes among adolescents experiencing school-related injuries. Nasokha et al. (2023) reported improvements in adolescents' emergency-handling capacity following splinting training. In addition, pediatric fracture management studies indicate that incorrect splint placement is relatively common and may lead to serious complications, underscoring the need for practical training (Abzug et al., 2019). Strengthening PMR members' competence in splinting can therefore contribute to a safer, more prepared school environment by enabling more effective immediate care for injured students.

Based on these considerations, this community service activity aimed to train PMR members at SMA Negeri 1 Sungai Raya in proper splinting techniques for school-based injury emergencies. This activity also aligns with the nursing role as an educator, which includes providing health education and information to improve community knowledge and skills in emergency management.

2. METHOD

The activity was conducted on October 4, 2024, at the Faculty of Medicine, Universitas Tanjungpura, and involved Youth Red Cross (PMR) members and their supervising teachers from SMA Negeri 1 Sungai Raya. The program was delivered as a training intervention using lectures, demonstrations, and facilitated discussion to strengthen participants' knowledge of splinting and to support hands-on practice of splint application for school-based injury scenarios. After the session, participants received educational materials (leaflets and posters) on splinting techniques.

This community service activity consisted of three phases: preparation, implementation, and evaluation. During the preparation phase, the community service team coordinated with the partner school (SMA Negeri 1 Sungai Raya) to identify priority needs and confirm

partner readiness for the planned activities. This phase also included development of the activity proposal, formation of the community service (PKM) committee, and administrative preparation (e.g., invitations, attendance lists, and pretest/posttest questionnaires).

During the implementation phase, team roles were assigned as presenters, facilitators, observers, and secretariat staff. The activity schedule and role distribution are presented in Table 1. Training equipment included wooden splints, triangular bandages, elastic bandages, and simulation materials (mannequins and/or peer volunteers). These materials were used in the demonstration and supervised practice sessions to provide participants with practical experience in correct splint application.

Training outcomes were assessed through knowledge testing and skills observation. Knowledge was measured using a 10-item multiple-choice questionnaire administered before (pretest) and after (posttest) the training. Because the instrument did not undergo formal validity and reliability testing, this limitation is acknowledged. Skills performance was assessed through direct observation during practice sessions using an observational checklist. In addition, verbal feedback was gathered during the discussion session to assess participants' understanding and self-reported confidence in performing splinting.

After the community service activity, participants received educational materials comprising leaflets and posters that explained proper splinting techniques.

Table 1. Activity schedule and jobdesc distribution

No.	Duration	Activities	PIC
1.	15 minutes	Registration	Committee
2.	15 minutes	Opening and welcoming remark	Leader of community service
3.	15 minutes	Ice breaking	Committee
4.	5 minutes	Pre test	Lecturer
5.	45 minutes	Lecture session about splinting	Lecturer
6.	60 minutes	Practice session	Team
7.	15 minutes	Discussion	Lecturer
8.	5 minutes	Post test	Lecturer
9.	15 minutes	Closing	Committee

3. RESULT AND DISCUSSION

This community service activity was implemented by a team of Emergency Nursing lecturers and undergraduate nursing students from the Bachelor of Nursing Program at Universitas Tanjungpura on Friday, October 4, 2024. The activity was conducted in collaboration with the partner school, SMA Negeri 1 Sungai Raya, and was attended by 30 Youth Red Cross (PMR) student members and one supervising teacher.

The training content focused on splinting techniques. Delivery methods included lectures with discussion, demonstrations, and guided practice.

3.1 Lecture and discussion

At the beginning of the session, participants completed

a pretest to assess baseline knowledge of splinting. The material was delivered using PowerPoint slides and an LCD projector. Discussion was integrated throughout the session to provide opportunities for questions and clarification.

3.2 Demonstration and guided practice

Facilitators demonstrated splinting procedures for common school injury scenarios, including simulated lower extremity trauma and upper extremity trauma. Participants then practiced splint application directly under facilitator guidance to reinforce correct steps and technique as presented in Figure 1.

3.3 Evaluation

Knowledge was reassessed using a posttest questionnaire administered after the training. Skills were evaluated through supervised practice, during which facilitators observed participants' ability to perform splinting procedures. The knowledge assessment results showed differences before and after the intervention, as presented in Table 2.



Figure 1 . Demonstration of splinting technique

Table 2 . Analysis of pretest and posttest results

Level of Knowledge about Splinting	Mean	Min	Max	Frequency (f)
Pretest	56.78	30	100	30
Posttest	92.96	50	100	30

3.4 Knowledge outcomes and interpretation

Based on the evaluation, PMR students demonstrated an improvement in knowledge regarding splinting, shifting from a fair level to a good level of knowledge. Figure 2 shows the knowledge improvement, it was reflected in an increase in the mean score from 56.78 on the pretest to 92.96 on the posttest. Review of individual score patterns indicated that most participants improved, although a small number showed minimal or no increase. This finding suggests that some students may benefit from additional targeted support, such as remediation sessions, repeated practice, or more individualized feedback.

These results align with prior studies indicating that training can improve first aid knowledge and skills among PMR students. For example, Listiana et al. (2019) reported that training influenced the knowledge and skills

of PMR members at SMA N 4 Bengkulu City. The improvement observed in this program may also reflect the appropriateness of the chosen instructional strategies. Lectures can efficiently introduce concepts and standard procedures, while discussion can clarify misconceptions and strengthen understanding (Rahman, 2018). In addition, demonstration-based instruction supports learning by showing procedural steps in sequence and enabling learners to connect information with observable practice, which may improve comprehension and retention (Prasetyawan et al., 2019). Consistent with this rationale, Ernasari et al. (2021) found improvements in knowledge and skills after first aid education delivered through training and simple simulations.

Overall, the results suggest that combining lectures, demonstrations, and hands-on practice was effective for improving both conceptual understanding and practical competency in splinting. Using multiple instructional methods may be particularly important for procedural skills, because learners benefit from both explanation and supervised performance opportunities.

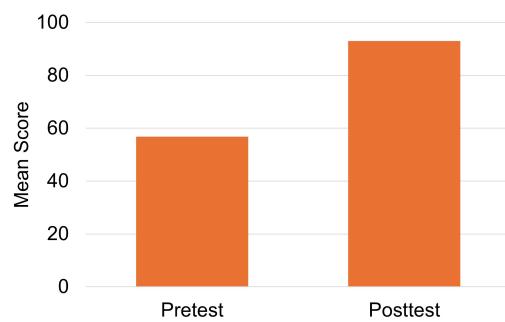


Figure 2 . Comparison of pretest and posttest knowledge scores

3.5 Limitations and strengths

The findings should be interpreted with caution because the pretest and posttest questionnaire used to measure knowledge had not undergone formal validity and reliability testing. As a result, the extent to which the items accurately measured splinting knowledge, and the consistency of the measurement, cannot be confirmed. Future programs should use instruments with established validity and reliability to strengthen evaluation rigor.

Strengths of this activity included active participation, interactive learning, and supervised practice that allowed immediate feedback. Limitations included the short duration of training and the relatively small number of participants, which may limit generalizability. Additional follow-up sessions and longer-term assessment would be useful to determine skill retention over time and to support participants who showed limited improvement.

4. CONCLUSION

The community service program with the Youth Red Cross at SMA Negeri 1 Sungai Raya was implemented successfully and met its objectives. This was reflected in consistent student participation throughout the activity and positive feedback from the partner school. The

program improved PMR students' knowledge and practical skills in splint application, which supports the goal of strengthening school based emergency response capacity. Based on these outcomes, a sustained and structured mentoring program is recommended for the Youth Red Cross. This program can include scheduled training on additional emergency procedures, such as basic life support, wound care, and first aid management, supported by clear procedures for evaluation, feedback, and follow up to promote sustainability and skill retention.

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CONFLICT OF INTERESTS

The authors declare no conflicts of interest.

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