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Improving Emergency Preparedness and Safety Management in Physical Education Settings

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Abstract
The high risk of accidents in elementary school environments requires physical education teachers to have emergency response competencies, including the ability to perform first aid and cardiopulmonary resuscitation (CPR). However, most teachers have not received adequate training in this area. This community service activity aims to enhance the capacity of PE teachers through theoretical and practical training covering CPR, AED use, and the integration of safety protocols into physical education activities. The implementation method includes initial coordination with the school, a pretest, classroom and field training, demonstrations, a posttest, and evaluation using a Google Form-based questionnaire. The results of the activity showed a significant improvement in participants' competencies: 90% of teachers were more skilled in handling emergencies, 95% were able to integrate safety protocols into learning, and 100% obtained formal competencies in CPR skills. Additionally, 95% of teachers demonstrated improved support for the school's medical team system, and 90% were able to incorporate physical safety into the curriculum. These findings confirm the effectiveness of systematic and practical training in enhancing teachers' preparedness. In conclusion, strengthening teachers' competencies in school safety should be an integral part of education policy, and such training should be conducted regularly to ensure comprehensive student safety.

Keywords: emergency preparedness, safety management, physical education

INTRODUCTION

Most physical education teachers have not received specialized training in first aid, including cardiopulmonary resuscitation (CPR). Teachers' lack of preparedness in handling emergency situations can worsen the condition of victims before medical help arrives. This knowledge gap is not limited to dental emergencies but extends to broader first aid skills. While some college physical education teachers have relatively high emergency preparedness, there are still significant deficiencies in relevant knowledge and training (Irawan et al., 2023; W. Yang, 2023). Furthermore, a study of physical education professionals outside the school environment revealed that despite having access to first aid content during their academic education, many professionals still feel unprepared and lack confidence in handling emergency situations, particularly in performing cardiopulmonary resuscitation and using automated external defibrillators (Adi S et al., 2023; Silva et al., 2022). The effectiveness of ongoing first aid training programs is underscored by research showing significant improvements in teachers' emergency response competencies following structured training interventions (Adi & Soenyoto, 2020; Neyişci, 2024). These findings collectively indicate that physical education teachers' limited knowledge of emergency response is primarily due to inadequate training and the need for systematic and comprehensive educational programs to enhance their readiness and confidence in managing emergencies.

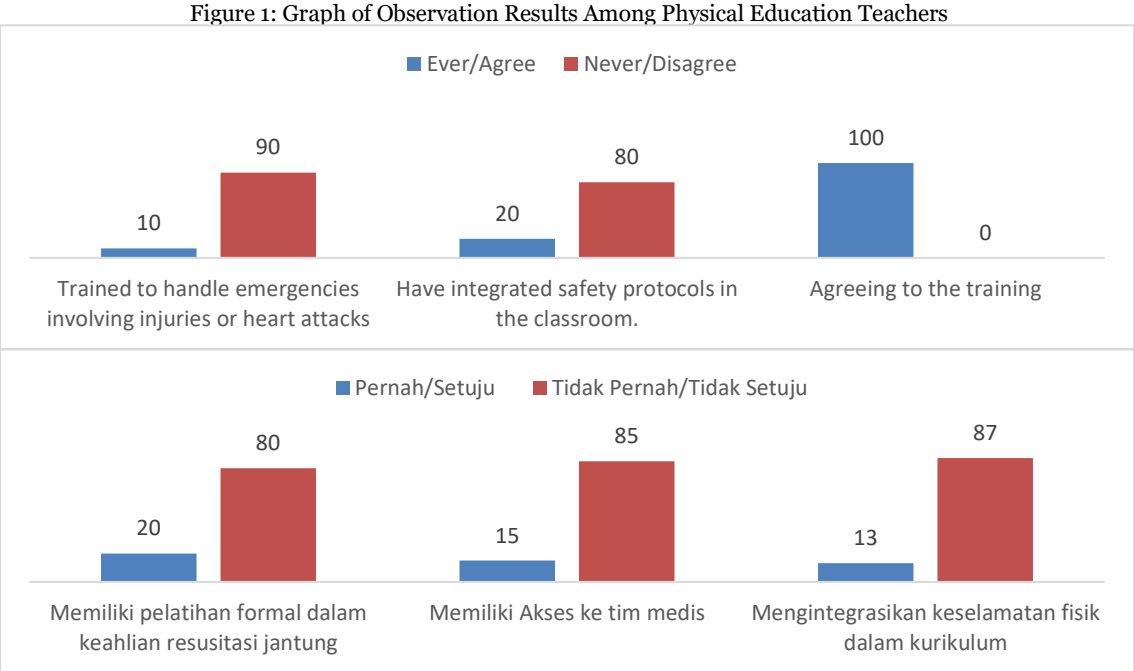
The lack of student safety facilities in schools is a multifaceted issue encompassing both physical and

psychological dimensions. In Magelang, Indonesia, the high incidence of traffic accidents involving students highlights the need for better transportation safety measures, such as improved public transportation services and designated safe routes for students (Adi et al., 2023; Adi S et al., 2024; Darmawan, 2022). Additionally, while some schools have basic safety equipment, there is a significant gap in knowledge and training on how to use these resources effectively during emergencies. This is exacerbated by the absence of a specific safety and security curriculum, leaving students unprepared to face potential disasters (Amidu Owolabi & Orhewere, 2021). Furthermore, safety strategies that focus solely on physical security may inadvertently marginalize certain groups of students, emphasizing the need for a fair approach that addresses emotional and structural safety issues (Caven, 2022). To address these issues, schools must implement comprehensive safety plans that include infrastructure improvements, educational programs on safety management, and culturally responsive strategies to ensure all students feel safe and supported.

The urgency for teachers to learn CPR is underscored by the critical role they play in educational settings where sudden cardiac arrest (SCA) can occur. Training programs have been shown to significantly improve theoretical knowledge and practical skills in CPR and the use of automated external defibrillators (AEDs) among teachers, with knowledge retention lasting up to two months post-training (Navarro Paton et al., 2021; Rumini et al., 2024). The effectiveness of such training is further supported by research on health vocational students, where significant improvements in CPR skills were observed post-training (Yundari & Asdiwinata, 2021). Additionally, the development of interactive teaching aids, such as CPR manikins equipped with sensors and learning guidance software, can facilitate self-directed learning and ensure that CPR becomes an easily learnable skill for the general population, including teachers (Guntur Firmansyah et al., 2022; Zhao, 2022)..

Issues were identified based on a Google Form, and information collection and interview results yielded the following problems

Figure 1: Graph of Observation Results Among Physical Education Teachers



METHOD

1. Permission and coordination with the Korsatpen Kec. Gunungpati party
2. Socialization with physical education teachers
3. The creation of materials by the volunteer team is coordinated with the Korsatpen Kec. Gunungpati.
4. Pretest Activity Pre-activity Test
5. Implementation of activities by the service team
6. Posttest
7. Evaluation and dissemination of community service activities. Evaluation and dissemination of community service activities.

The data collection instrument is a questionnaire to measure the understanding and knowledge of physical education teachers in community service activities. The target audience for this community service is physical education teachers. This instrument will be sent via Google Form.

The method in this activity is carried out in three stages, as follows: a) preparing the training needs such as the venue and training materials, b) organizing the activity schedule. The activities are conducted in the form of theory-based (lectures) and practical assistance, c) presenting the training materials, d) presenting the swimming safety training materials, e) conducting swimming safety practice, f) finally, to assess the training results, a questionnaire will be given to participants to gauge their understanding of the activity, and h) the percentage of results from this training will be documented in a report to be submitted to the school and participants.

Delivery method:

1. Classroom Training: Delivering theoretical material related to the basics of safety in sports classes, injury risk management, and an introduction to cardiopulmonary resuscitation (CPR) protocols. Using interactive presentation media, educational videos, and group discussions to reinforce participants' understanding.

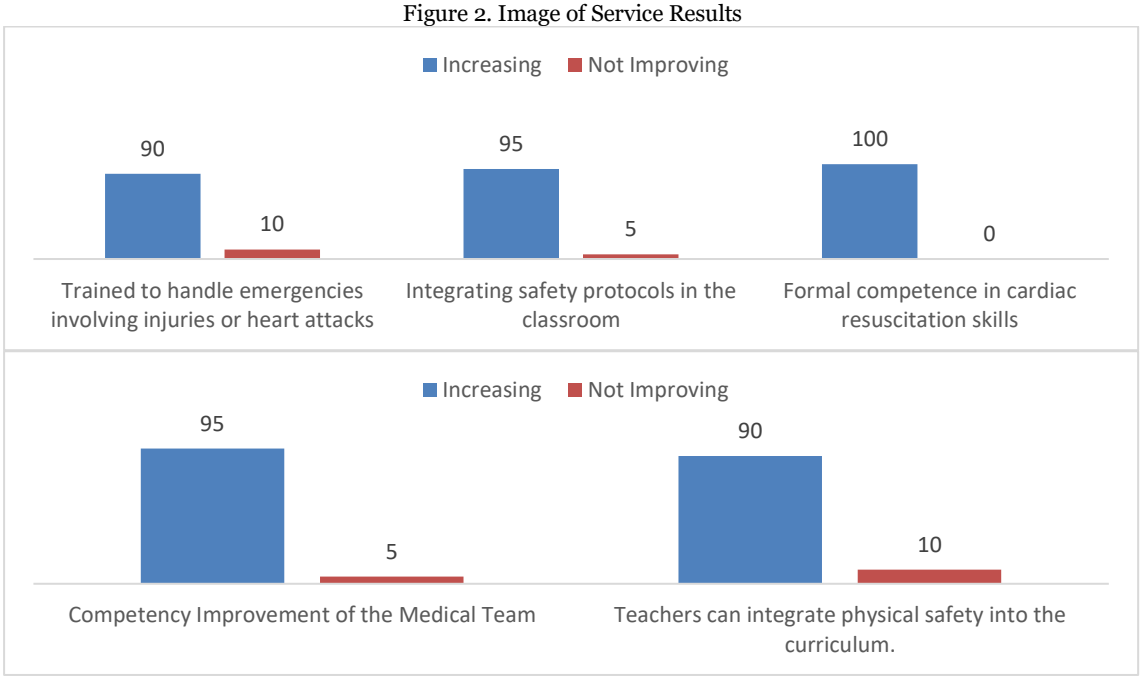
2. Demonstration Training: Showcasing practical steps in handling emergencies such as physical injuries, heart attacks, or accidents on the sports field. Involving live demonstrations by professional instructors, including the use of tools like AED (Automated External Defibrillator) and first aid equipment.

3. Case-Based Learning: Using real-case simulation scenarios to train participants in analyzing and resolving emergency situations in sports classes. Providing participants with the opportunity to discuss, formulate handling strategies, and present their solutions.

4. Field Practice Training: Providing participants with the opportunity to discuss, formulate handling strategies, and present their solutions. Providing participants with the opportunity to discuss, formulate handling strategies, and present their solutions.

RESULT AND DISCUSSION

Figure 2. Image of Service Results



The high risk of accidents in elementary schools is a diverse issue influenced by various factors, including inadequate first aid knowledge among teachers, unsafe crossing behaviors, and insufficient safety measures. A study revealed that nearly half of elementary school teachers have poor knowledge of first aid, which is crucial for preventing complications from accidents (Adi et al., 2021; Saranya et al., 2023). Similarly, in China, a systematic analysis identified unintentional injuries as a critical safety risk in schools, alongside public health issues and facility safety (Mashari & Adi, 2021; J. Yang et al., 2022). Road traffic accidents are another significant risk, with a study in Belgium showing that more than half of the observed children exhibited unsafe crossing behaviors, such as not stopping at the sidewalk or looking for oncoming traffic (Riaz et al., 2022; Yuwono et al., 2025). Efforts to reduce this risk include health education programs that significantly improve first aid knowledge among parents and school staff, as demonstrated in a study at an elementary school. These findings underscore the importance of comprehensive safety education and infrastructure improvements to reduce the risk of accidents in elementary schools.

Physical education teachers play an important role in managing student safety, but whether they are

pioneers of student safety is a nuanced question (Adi et al., 2025). The complexity of risk and safety management (RSM) in physical education is highlighted by teachers' perceptions and practices, which often involve balancing safety with educational experience. Teachers generally consider RSM to be important, yet their practices are sometimes marked by uncertainty and reliance on teaching experience and judgment rather than formalized safety protocols (Porsanger & Magnussen, 2021; Saifulloh et al., 2024). Similarly, high school physical education teachers advocate for mandatory safety education and regular inspections to foster a safe educational environment, indicating that institutional improvements are needed to enhance safety management (Li et al., 2024). Despite these efforts, teachers often do not primarily conceptualize their safety measures as RSM, indicating a gap between practice and perception (Porsanger & Magnussen, 2021). Therefore, while PE teachers are key players in student safety, they are not solely pioneers, as effective safety management requires comprehensive institutional support and resources.

The correlation between safety and student achievement is diverse, encompassing psychological, behavioral, and environmental dimensions. Psychological bulwark, as explored by Kobicheva, correlates positively with performance and academic engagement, especially bullet in digital learning environments. This study found that students, especially girls, who feel psychologically safe, show higher levels of engagement and academic performance, indicating that psychological safety is an important factor in academic success (Meilani & Adi, 2025; Tatiana et al., 2022). In a laboratory setting, Yu et al. identified a strong positive relationship between students' safety behaviors and their learning efficiency. This study revealed that students who exhibited conscious safety behaviors in laboratory experiments achieved higher scores, indicating that safety awareness directly enhances learning efficiency and professional knowledge acquisition (Adi S et al., 2025; Yu et al., 2023). In elementary schools, Anthony et al. highlight that an unsafe school environment, characterized by issues such as violence and emotional pressure, negatively impacts students' academic performance. This study recommends the implementation of security measures and the involvement of parents and stakeholders to enhance school safety, thereby improving academic outcomes (Arbanisa & Adi, 2025; Wanyama Anthony et al., 2022). Similarly, Kibriya and Jones found that unsafe school environments in Tanzania significantly hinder learning outcomes in subjects such as reading and mathematics. Their research underscores the importance of school safety as a crucial factor in educational achievement, advocating for policy interventions to address safety issues (Kibriya & Jones, 2021).

CONCLUSION

First aid and safety training for PJOK teachers showed very positive results. The majority of participants experienced significant improvements in cardiac resuscitation skills, emergency response handling, and the ability to integrate safety into the curriculum. In addition, this training also strengthens the role of teachers in supporting the formation of school medical teams and creating a safe learning environment. These findings emphasize the importance of systematic and sustainable training programs to equip teachers with comprehensive safety competencies to support the welfare and protection of students during educational activities. The activity was attended by physical education teachers from the Gunungpati District. In the future, it needs to be conducted at a higher level and with a broader scope. This community service is funded by the Rector's Decree of Semarang State University Number B/255/UN37/HK.02/2025 concerning the Appointment of Research and Community Service Implementers from the Budget Implementation List (DPA) of the Research and Community Service Institute of Semarang State University for the Year 2025.

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DECLARATION OF CONFLICTING INTERESTS

The authors states that there is no conflict of interest in the publication of this article.

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