Education and Demonstration of C-Spine Control in Emergency Victims Out of Hospital Condition

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Abstract

Emergency conditions in the school environment have a significant prevalence in community emergency incidents. This community service aims to increase the knowledge and skills of students at SMKN 4 Kota Bengkulu in handling emergencies, especially C-Spine Control. The community group that partners in this community service activity is SMKN 4 Kota Bengkulu. Community service is carried out in 3 stages: preparation stage, implementation stage, and evaluation stage. Participants will undergo a pretest to assess their skill scores. After that, the community service team will teach and demonstrate C-Spine Control handling. The team will then reevaluate to measure skill scores. The results show an improvement in the skill scores of students at SMKN 4 Kota Bengkulu after receiving emergency handling demonstrations. The school can create a regular schedule to hone and refresh students' abilities in providing emergency care, especially in emergencies in the school environment.
Keywords: C-Spine Control, Demonstration, School Emergency

Abstrak

Kondisi gawat darurat di lingkungan sekolah memiliki prevalensi yang cukup besar dalam kejadian gawat darurat di masyarakat. Pengabdian masyarakat ini bertujuan untuk meningkatkan pengetahuan dan keterampilan siswa SMKN 4 Kota Bengkulu dalam melakukan penanganan gawat darurat, khususnya *C-Spine Control*. Kelompok masyarakat yang menjadi mitra dalam kegiatan pengabdian masyarakat ini adalah SMKN 4 Kota Bengkulu. Pengabdian masyarakat dilakukan dalam 3 tahapan, yaitu tahap persiapan, tahap pelaksanaan, dan tahap evaluasi. Peserta akan menjalani pretest terlebih dahulu untuk melihat skor keterampilan. Setelah itu, tim pengabdian akan mengajarkan dan mendemonstrasikan penanganan *C-Spine Control*. Setelah itu, tim akan melakukan evaluasi kembali untuk mengukur skor keterampilan. Hasil yang didapatkan adalah adanya peningkatan skor keterampilan siswa SMKN 4 Kota Bengkulu setelah diberikan demonstrasi penanganan gawat darurat. Pihak sekolah dapat membuat jadwal rutin untuk mengasah dan menyegarkan kembali kemampuan siswa dalam memberikan penanganan gawat darurat, khususnya di lingkungan sekolah.
Kata Kunci: C-Spine Control, Demonstrasi, Gawat Darurat Anak Sekolah

A. INTRODUCTION

Emergency incidents are still one of the factors causing injuries and even deaths in the community. Emergency situations that occur suddenly are unexpected and cause panic for the victims and people around them (Irwadi, Nursyam, et al., 2025). Moreover, these conditions generally occur outside the hospital with unprepared rescuers (Siyamti et al., 2025). Therefore, preparedness for emergency situations needs to be improved as an effort to reduce the risk level for the victims (Negeri, 2025).

One location that has the potential for emergency conditions is Vocational High Schools (Oppong Asante et al., 2025). School-age children are one of the groups that are potentially at risk of experiencing emergency conditions, especially at school. The current phenomenon is the lack of knowledge of emergency handling among vocational high school students. Therefore, when

emergency conditions occur at school, pre-hospital initial treatment does not run optimally (Sari et al., 2022).

The results of a global study found that 40% of teenagers have experienced emergency situations while at school (Oppong Asante et al., 2025). In Southeast Asia, 1% of emergencies occurred, with 7.1% being severe trauma in the school environment (Chen et al., 2025). Studies in Indonesia show various types of injuries and emergencies that occur in Indonesia, including abrasions, bruises, sprains, lacerations, fractures, sports injuries, and other emergencies caused by environmental conditions and school areas (Setiyaningrum et al., 2025). This indicates that the phenomenon of emergencies in the school environment is quite high and impacts the learning process and students' health status (Ikhsan & Setiyarini, 2025).

SMKN 4 Kota Bengkulu is one of the schools located near the long coastline of Bengkulu Province. This makes SMKN 4 one of the schools that have a relatively high risk of natural disasters. In addition, the vocational school program that focuses on light motorcycle and automotive engineering is one of the risk factors for emergency incidents such as accidents during practice, internships, or work. Therefore, it is important for students of SMKN 4 Kota Bengkulu to be equipped with adequate knowledge of emergency response (Kemendikdasmen, 2025).

School-age children's knowledge in handling emergency situations is one of the useful skills (Hastuti et al., 2025). Emergency situations can occur not only during learning activities in the school environment but also when students are engaged in activities outside of school (Nusdin et al., 2025). Practical activities, extracurriculars, and other self-development activities are part of the daily routine for school-age children (Suindrayasa et al., 2025). The lack of emergency response equipment and limited knowledge when outside the school environment are among the reasons for the risk of worsening the health condition of victims. Therefore, efforts are needed to improve knowledge for school-age children.

Efforts to improve knowledge of emergency care can be done through various methods (Ida et al., 2025). Methods that can be used include health education, demonstrations, and simulations (Siyamti et al., 2025). Available methods have shown an increase in knowledge of emergency care (Purwacaraka et al., 2025). However, in school-age children, the tendency towards boredom, distractions from online games that seem more appealing, and interest in technological developments require creativity in packaging health information (Rahmawati & Rahmawati, 2025).

Some of the issues found are that the ability to handle emergencies in school-age children does not have a significant and lasting impact on daily life (Pangaribuan et al., 2025). This means that the knowledge and skills possessed are only formalities during training (Devi et al., 2025).

B. METHODS

The method of implementing this community service activity consists of 3 stages shown in the diagram below:

1. Preparation Stage

   The preparation stage was carried out by starting team coordination with LPPM UNIB. Next, the schedule of activities and the division of tasks between TIM members were prepared. The target partner is SMKN 4 Bengkulu City. The students involved in this community service activity amounted to 34 people from the Automotive Light Vehicle Engineering (TKRO) and Light Vehicle Body Engineering (TBKR) expertise programs. The university and SMKN 4 Bengkulu City coordinate with each other in completing all administrative and licensing matters so that activities can run well and smoothly.

   The next stage is to discuss with the team regarding the educational methods that will be provided to help improve students' knowledge in handling emergency victims who are suspected of having a cervical injury. The result of this discussion, deliberated with the team, was the provision of health counseling methods and demonstrations. The educational content that will be provided is about the handling of *C-Spine Control* in emergency victims out of hospital. The community service team also compiled an instrument consisting of 20 questions that were used to measure students' knowledge levels before and after the provision of education and demonstrations. The knowledge level instrument has passed *the expert* test by Mrs. Desi Susilawati, S.Kep., M.Kep., Sp.Kep.MB., who has a scientific background in Medical Surgical Nursing with a specialization in Emergency.

2. Implementation stage

   The counseling was held on January 14, 2026, at SMKN 4 Bengkulu City, which was carried out in the student learning room. The stages carried out are as follows:

a. Conduct a pretest first to measure the level of knowledge and skills of students before being given health counseling and demonstrations. The measuring instrument used is an instrument that contains questions about understanding and handling using *the C-Spine Control* technique in emergency victims.
b. Providing material related to the handling of *C-Spine Control* for emergency victims at SMKN 7 accompanied by demonstrations. Counseling materials are given to students who have been selected by the school using *PowerPoint media displayed using an LCD projector.* After the counseling materials were given, students were demonstrated the steps to handle victims suspected of having cervical injuries by performing *the C-Spine Control technique.*
c. Conduct a posttest to measure the level of knowledge of students after counseling using the question instruments that have been provided.

3. Evaluation Stage

Evaluations were carried out before and after counseling and demonstrations were given. The evaluation was carried out by asking students to answer an instrument containing questions related to handling emergency victims who require *C-Spine Control skills*. Evaluation during the pretest was carried out to measure the level of understanding and accuracy of students' actions related to the handling of *C-Spine Control* in emergency victims. The second evaluation is carried out during the posttest, where the level of student understanding related to *C-Spine Control will be measured* in emergency victims. The results of the evaluation obtained are in the form of knowledge level scores from the questions given. The minimum score of the instrument used is 0, and the maximum score that can be obtained is 100.

C. RESULTS

The results of community service were obtained by comparing the differences in pretest and posttest scores conducted on SMKN 4 students in Bengkulu City. The pretest is carried out by measuring students' knowledge scores related to the handling of *C-Spine Control* before being given counseling and demonstrations. After the counseling was given, the team re-measured the students' skill scores.

Table 1. Pretest Scores for Students of SMKN 4 Bengkulu City

Score Range	Frequency	Percentage
86 – 100	0	0,0
76 – 85	18	52,9
60 – 75	16	47,1
< 60	0	0,0
Total	**34**	**100**

Table 2. Posttest Scores of Students of SMKN 4 Bengkulu City

Score Range	Frequency	Percentage
86 – 100	15	44,1
76 – 85	19	55,9
60 – 75	0	0,0
< 60	0	0,0
Total	**34**	**100**

Table 3. Simple Statistical Analysis

Variabel	Mean	SD	p-value
Pretest	76,12	3,59	0,000
Posttest	85,44	3,27	0,000

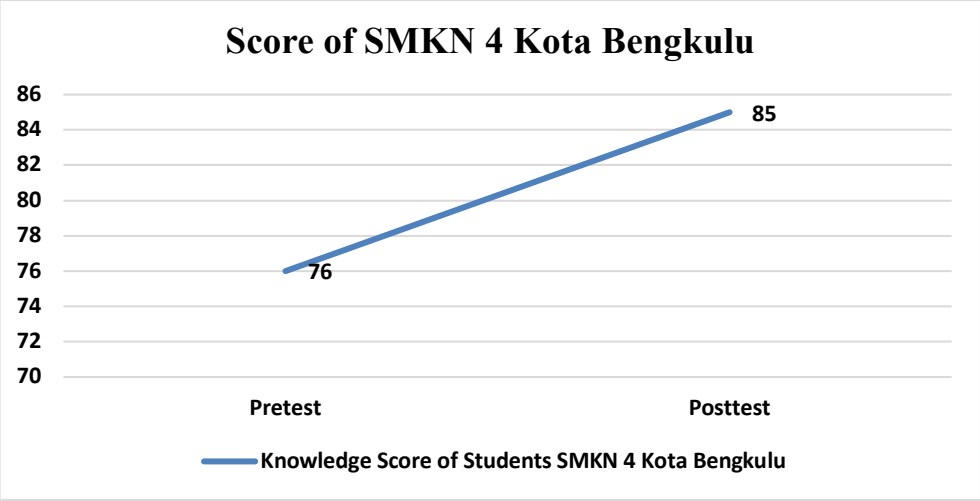

Figure 1. Graph of the Knowledge Level of Students of SMKN 04 Bengkulu City Before and After the Provision of Education and Demonstration

Figure 2. Demonstration

Figure 3. Counseling

Figure 4. Evaluation

Emergency conditions can occur in various places such as at home, at school offices, sports venues, both when someone is alone or in the middle of a crowd. In the school environment, emergency situations are often encountered due to falls, sports injuries, including fainting (Ramba et al., 2025). Therefore, in an emergency situation, immediate action is essential to avoid potential hazards or accidents. Prompt and urgent handling is needed to prevent further loss or damage (Rizal et al., 2026). Among students, especially in the early teenage stages, emergencies are frequent and can be life-threatening. This situation requires immediate treatment to prevent disability or death (Permana & Bherty, 2025).

An emergency is a condition that has the potential to occur suddenly and requires quick and appropriate handling. The school environment has various risk factors, such as students' physical activity, practical activities, and high mobility, that can increase the likelihood of accidents, such as falls, trauma, or head and spine injuries (Irwadi, Nursyam, et al., 2025). These injuries, especially to the spine, can have a serious impact in the form of permanent disability or death if not handled properly from the beginning of the incident (Af'idah et al., 2025).

Spinal cord injuries due to trauma, especially in the cervical segment, are a very dangerous condition. Cervical injuries can cause neurological disorders, such as paralysis or neurogenic shock, with significant mortality rates. Research by Rohmah et al. (2025) shows that injuries to the cervical area have a major contribution to the incidence of severe complications and mortality in spinal trauma patients. Thus, proper early treatment is an important aspect in preventing the worsening of the victim's condition.

Community service activities at SMKN 4 Bengkulu City have a strategic impact on the emergency aspect. This impact is not only felt by the school because it has rescue cadres among students, but also by the school's contribution in helping the surrounding community who are experiencing emergency conditions. The education and demonstrations provided can be valuable experiences and information for students in dealing with emergency situations that can occur at any time.

Providing health education can help have a positive impact on students at school. The provision of health education provides new information for students in handling emergencies (Purwacaraka et al., 2025). The knowledge provided became a new experience for students in stabilizing cervical bones in emergency victims before being taken to the hospital. Knowledge about handling emergency victims before being taken to the hospital can reduce the risk of advanced injuries that aggravate the victim's condition (Irwadi, Rahmadhian, et al., 2025).

Providing education by combining health counseling and demonstrations can increase the depth and breadth of the material provided. Giving demonstrations can depict situations and actions in dealing with emergency victims. Demonstrations can depict actions in a real way and seem more interesting to participants (Ida et al., 2025). So that a combination of education (lectures) with demonstrations can create a more interesting and real atmosphere for participants (Irwadi, Nursyam, et al., 2025).

The provision of health information by combining health education (lectures) with demonstrations provides great benefits in increasing the knowledge of SMKN 4 Bengkulu City students. The information provided will be more real and absorbed more optimally with the real experience provided during the demonstration with students. This increases the students' interest in understanding the material presented, which is accompanied by real actions in handling emergency victims in *the C-Spine Control* technique.

D. CONCLUSION

The community service that has been carried out is able to increase the knowledge of SMKN 4 Bengkulu City students in providing *C-Spine Control* treatment. This is one of the important aspects in handling emergency victims that requires adequate knowledge and skills. To improve and develop these skills, the school can collaborate with health agencies and health education institutions in compiling a routine schedule to carry out refresher courses and training for SMKN 4 Bengkulu City students.

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