

## Original Research Article

# Effect of cardiopulmonary resuscitation training towards cardiac arrest emergency knowledge upon students at Student Health Association of Universitas Gadjah Mada, Indonesia

Bayu Fandhi Achmad\*

Department of Basic and Emergency Nursing, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

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### \*Correspondence:

Bayu Fandhi Achmad,

E-mail: bayu.fandhi.a@ugm.ac.id

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## ABSTRACT

**Background:** The cardiovascular disease, especially the sudden cardiac arrest, was the main cause of death and disability throughout the world. The cardiopulmonary resuscitation (CPR) that should be taken by the first responder or witness was an important part in the chain of survival out of the hospital that could improve the prognosis and avoid the rest of the symptoms. Hence, it is important for students to know and possess the skill, especially the cardiopulmonary resuscitation, to handle the emergency situation. University became the appropriate place to organize the CPR training because the students were more conditioned in emotional, social and cultural terms.

**Methods:** This research utilized the quasi-experiment method. The total number of research subject was 56 Universitas Gadjah Mada students at Student Health Association. The implementation of intervention of this research was conducted on 07 July, 2018. The topic in this research intervention were formed based on American Heart Association (AHA) Guideline 2015. Pretest and posttest instrument were 10 multiple choices with five choices of answer.

**Results:** This research proved that the CPR training gave effect on the improvement of the knowledge about emergency situation, particularly the cardiac arrest through cardiopulmonary resuscitation. The pre-test and post-test results showed that there was a knowledge improvement after the training ( $p=0,000$ ).

**Conclusions:** CPR training could be recommended to have an impact on increasing student knowledge in emergency management, especially cardiac arrest.

**Keywords:** Cardiopulmonary resuscitation, Cardiac arrest, Student

## INTRODUCTION

Cardiovascular disease especially sudden cardiac arrest is the main cause of death and disability in the world. Around 17.7 million people per year died due to cardiovascular disease with cardiac arrest incidence which is always inclining.<sup>1</sup> Cardiac arrest is one of the major causes of death in the world. American Heart Association (AHA) stated that more than 1000 people experience non traumatic cardiac arrest which happen out of hospital, including 26 children in the United States of America.<sup>2</sup>

Seventy percent of cardiac arrest incidence happens out of hospital (out-of-hospital cardiac arrest/OHCA) with first aider is people in society, such as family members, friends, neighbours, and other people who are considered close.<sup>3</sup>

First aid is done by the first aider or witness is an important part on chain of survival out of hospital. Cardiopulmonary resuscitation (CPR) which is done by first aider raises life expectancy and prevent sequelae. Furthermore, it is explained that life expectancy of someone who experiences cardiac arrest may significantly increase two

to three times more by performing CPR by first person who encounters it. This will reduce brain tissue necrosis and enhance circulation-return. On the other hand, delay in doing CPR will decrease life expectancy to 5-10% per minute.<sup>1</sup> Hence, it is important for common people to receive training regarding emergency situation specifically CPR. Someone who has received first aid training will provide better and more confident help in performing CPR than someone who has never received the training.<sup>4</sup> Hence, education and training for first aider becomes an essential matter.<sup>5</sup>

Training and education on CPR will be more optimal when it is given to students. Students have been capable in receiving materials regarding first aid and emergency prevention. This corresponds with the consensus which stated that students have the maturity in attending training, good skills in performing cardiopulmonary resuscitation, willingness to provide emergency help to family, friends, or even strangers.<sup>6</sup> Campus is generally a place to support emergency learning specifically CPR to recognize knowledge and skill to save a life. Individually, for students, CPR training will improve knowledge and skill which may save a life, raise awareness and mental readiness for emergency case, increase self-confidence, and give contribution for campus and community.<sup>2</sup>

This research aims to determine the effectiveness of CPR training towards cardiac arrest emergency knowledge upon students at Student Health Association of Universitas Gadjah Mada.

## METHODS

This research was a quasi-experimental research having one group pre-test and post-test design with quantitative approach. The implementation of intervention of this research was conducted on 07 July 2018. The research was located in Universitas Gadjah Mada, Yogyakarta. Purposive sampling technique was used in this research. Inclusion criteria were applied for students who joined Student Health Association of Universitas Gadjah Mada and zero experience in basic life support training. Exclusion criteria were applied for student who had academic leave.

Intervention of this research was CPR Training. First, research respondents did pre-test questions for 20 minutes. Delivering materials to those three groups was conducted for 100 minutes of consisting of 3 topics namely: introduction to help for emergency condition, introduction to emergency condition, and CPR based on the AHA Guideline 2015 (Table 1).

Furthermore respondents followed CPR practical skill session according to AHA Guideline (2015) used a CPR mannequin. Firstly, the instructor gave a practical example of CPR for practice and then the subject is asked to try to do CPR one by one each of 2 minutes to perform CPR 5

cycles. In the final session of the training, respondents were asked to do post-test for 20 minutes.

Pre-test and post-test aimed to determine respondents' knowledge level regarding cardiac arrest emergency. The topic in this research intervention were formed based on AHA Guideline 2015. Pretest and posttest instruments were 10 multiple choices with five choices of answer.

**Table 1: Training materials.**

Topic	Sub topic	Duration (minutes)
<b>Introduction to help for emergency condition</b>	Basic principal of emergency	20
	Ethics on emergency handling	
<b>Introduction to emergency condition</b>	Introduction to cardiac arrest sign for common people	20
	Introduction to chain of survival	
	Phone numbers for emergency situation	
<b>CPR based on the AHA Guideline 2015</b>	CPR technique	60
	High quality CPR	

The study had been approved by the ethical committee of Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada in their approval letter with the Ref. no. : KE/FK/0550/EC. Respondents' participation was voluntary and respondents were not compensated for their participation.

## RESULTS

### *Respondent characteristics*

This research respondents were 56 people namely students of Universitas Gadjah Mada from 18 faculties namely Faculty of Biology, Faculty of Economics and Business, Faculty of Pharmacy, Faculty of Philosophy, Faculty of Geography, Faculty of Law, Faculty of Cultural Sciences, Faculty of Political Sciences, Faculty of Dentistry, Faculty of Veterinary, Faculty of Medicine, Public Health and Nursing, Faculty of Forestry, Faculty of Mathematics and Natural Sciences, Faculty of Agriculture, Faculty of Animal Sciences, Faculty of Psychology, Faculty of Engineering, and Faculty of Agricultural Technology. The respondent characteristics are shown in Table 2.

### *Student knowledge regarding cardiac arrest emergency before and after CPR training*

The research result showed that there was a statistically significant improvement ( $p=0,000$ ) of the pre-test and post-test results (Table 3).

**Table 2: Respondent characteristics (n=56).**

Characteristics	F	Percentage (%)
<b>Gender</b>		
Male	13	23.21
Female	43	76.79
<b>Semester</b>		
2 <sup>nd</sup>	4	7.14
3 <sup>rd</sup>	26	46.43
4 <sup>th</sup>	12	21.43
5 <sup>th</sup>	14	25

**Table 3. Difference of student knowledge before and after training (n=56).**

Pretest		Post-test		P value
Mean	Standard deviation (SD)	Mean	Standard deviation (SD)	
58.04	16,89	89.82	9,81	0.000

## DISCUSSION

Various types of accident and emergency cases often happen in school and campus environment, hence those can cause the risk of disability to death. Accident and emergency require quick and appropriate help.<sup>7</sup> Emergency cases which often happen in community one of which is related to cardiovascular disease. This matter became the foundation of AHA in promoting training for students to attend cardiopulmonary resuscitation training. CPR training for students provides benefits in reducing death due to out of hospital cardiac arrest.<sup>8</sup> The incidence of cardiac arrest which happens on campus is only 2.6% of all locations in public places, however training given to students on campus is able to improve CPR skills needed in any location. This was based on a research which stated that adolescents are likely to spend more time in public places such as mall, cardiac arrest incidence often occurs in that very place. Hence, CPR introduction towards adolescents will bring a significant impact for the community cardiac arrest care.<sup>6</sup>

Prior knowledge considering cardiac arrest emergency based on pre-test score showed low results. However, after the delivery of materials, post test result showed a significant difference. Method which was applied in this research besides lecturing method was directly asking the respondents to have a practice of CPR method as well (hands-on experience). This proved that the method was an effective method in improving knowledge of cardiac arrest emergency. It was supported by a research which showed that hands-on experience method was easily adapted and applied, moreover it as well improved retention of knowledge and skills after the training was conducted.<sup>9</sup> Furthermore, it was also explained that the application of practice while watching and hands-on experience method will improve psychomotor skill of CPR.<sup>5</sup>

CPR training for students reduced fear in doing first aid upon emergency case. Students had quite enough cognitive and physical skills to play role as first aider in emergency case specifically in cardiac arrest. The research recommends the university to hold a routine CPR training. This is essential to give introduction to students in a practical way in managing emergency.

The limitation of this study is that the training was focused only on the cardiopulmonary resuscitation technique for ordinary people, hence it can be added with the material of using automatic external defibrillation (AED) for ordinary people to increase the life chances in the case of cardiac arrest.

## CONCLUSION

CPR training has benefit in emergency care specifically for out of hospital cardiac arrest. This research proved that CPR training gave impact on the improvement of student knowledge upon the emergency care especially cardiac arrest.

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