# Improving CPR Skill Through the Use of two Exciting Learning Methods

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**Abstract.** There are at least10. 000 cases of cardiac arrest occurannually in Indonesia. The use of CPR as the first aid is necessary to be administered immediately because cardiac arrest often attacks outside of the hospital. Accordingly, CPR training is required to be taught in order to increase the number of competent people in performing CPR. The aim of this research is to identify the difference between the use of visual method (poster) and simulation method on the skill of doing CPR at the students of SMKN 1 Banjarbaru. It used quasi-experimental design and post test only design with simple random sampling as the approaches. There were 50 respondents divided into 2 groups, they were visual (poster) and simulation. The data was collected through observation sheet. Mann Whitney test was employed for the data analysis. The result is p-value 0,001. Moreover, *p-value* 0,000<α= 0,05 means that there is a difference between visual (poster) group and simulation group of the students' skills in carrying out CPR. The result of the research shows that the average value on simulation method is higher than visual (poster) method.

**Keywords**: CPR skill, visual (poster), simulation

## 1. Introduction

Cardiac arrest is one of the emergencies that can occur suddenly and anywhere, so an immediate treatment is absolutely needed to a person who suffered from this condition [1]. Out-of-hospital cardiac arrest affected 326.200 people from the world population in 2015 [2]. In Indonesia, the cases of cardiac arrest are around 300.000-350.000 in a year [1]. Hence, CPR training can enhance the skill of rescuer to the cardiac arrest survivor because it can become the first aid to prevent death of brain cells and damage to vital organs. Since there are 4 minutes span before the circulation get decreased and brain cell get damaged, giving on CPR as the first aid is such a must to do to prevent the worse effect. Accordingly, people are required to have good skill to apply CPR for example by doing chest compressions. Related to this, providing training about this skill is really important to improve someone's ability in carrying out CPR properly [3].

Cardio Pulmonary Resuscitation (CPR) can be administered by anyone. Every adult should have competence to give CPR. Moreover, it is also better to be taught adequately to children so that they can give an immediate rescue as well [4]. A previous study conducted in Germany found that a 13 years old teenager was able to perform chest compressions as the same as adult in providing CPR [5]. Training process that performed by a CPR bystander can be taught by a variety of learning methods. The use of appropriate learning method plays a substantial role in transferring the knowledge precisely and correctly [6]. Simulation is a learning method that often employed to teach CPR for people in common. Since simulation

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gives a more interactive way in the teaching process, trainees can have a face to face ordirect communication with the trainer/facilitator [7]. Beside simulation method, visual (poster) method is also useful to analyze and explain the action concept displayed from the poster. This media usually contains pictures presenting information or certain notice that commonly found in public area to gain response from the people [8].

## 2. Research Methods

The design of this research used quasi experimental and post-test only design. The population was taken from XI grade students in SMKN 1 Banjarbaru which amount to 56 students in total. The researcher employed probability sampling technique and simple random sampling as the approach. The sample was 50 samples that divided into two groups. Furthermore, mannequin, observation sheet, poster, and simulation were the instruments to collect the data for this research. The poster was made by the researcher based on the guidance from American Heart Association in 2015. Besides, the observation sheet which intended to assess students' CPR skill was also created by the researcher based on the same guidance. It consists of 4 item statements using Guttmann scale that had been examined by the expert which resulted 1 from the I-CVI value.

## 3. Result and Discussions

**Age**

Table 1. Distribution of characteristic frequency on the respondents' age in (poster) group and simulation group

| Age | Mean | Median | Min-Max | SD | CI 95% |
|---|---|---|---|---|---|
| Simulation | 16,92 | 17,00 | 16-18 | 0,4932 | 16,71–17,12 |
| Visual (Poster) | 16,76 | 17,00 | 16-17 | 0,4358 | 16,58–16,93 |

Based on this table, the average age of the respondents in visual (poster) group is 16,92 and the average age of simulation group is 19,76 and the median for both groups is 17 years old. Students in this age have a really high curiosity toward new things [9]. According to Bohn *et.al.*, to enhance knowledge and skill, children should be trained to perform CPR since the age of 12 [10]. Related to this, the ability to understand information is generally reduced in the elderly, therefore it will be worthy to learn to do CPR started from younger ages [11].

**Gender**

Table 2 Distribution of characteristic frequency on the respondents' gender in visual (poster) group and simulation group

| No. | Gender | Simulation Group | | Visual (Poster) Group | |
|---|---|---|---|---|---|
| | | n | % | N | % |
| 1. | Male | 7 | 28,0 | 8 | 32,0 |
| 2. | Female | 18 | 72,0 | 17 | 68,0 |
| | Total | 25 | 100,0 | 25 | 100,0 |

This data presents both groups are dominated by female respondents. There are 18 students (72%) in visual (poster) group and 17 students (68%) in simulation group. It is also found that male students are more reliable in performing CPR than female students. Due to

this, boys have better ability to achieve optimal depth during the chest compressions, because they gain more power than the girls [12]. However, the girls arealso able to apply chest compressions as deep as the boys up to the optimal depth. It is done by placing hands $90^0$upright to the chest of the body and doing compressions up to 5-6 cm depth [2].

**Skill in Performing CPR on the Students Trained by Visual (Poster) Method**

Table 3 Skillin Performing CPR on Students Trained by Visual (Poster) Method

| Group | Mean | Median | Min-Max | St.Dev | CI 95% |
|---|---|---|---|---|---|
| Visual (Poster) | 76,60 | 75,00 | 45-100 | 13,595 | 70,98 – 82,21 |

It finds out that the respondents' average value of doing CPR after being trained using visual (poster) is 76,60. It shows that visual (poster) method is good to be employed for learning to improve CPR skill performance. This method has the advantage of being able to highlight information through short sentences, colors and images so that it can easily attract people. By the use of a vivid visualization, it can directly grab people's attention and it stimulates them to try to do things as informed on the poster [13]. This is the benefit of visual (poster) method that can be carried out anywhere and anytime, yet this method cannot provide direct feedback to the students [13].

**Skill in Performing CPR on the Students Trained by Simulation Method**

Table 4 Skillin Performing CPR on Students Trained by Simulation Method

| Group | Mean | Median | Min-Max | St.Dev | CI 95% |
|---|---|---|---|---|---|
| Simulation | 88,40 | 95,00 | 50-100 | 13,973 | 82,63–94,16 |

Based on the research findingsin 25 respondents, the students' skill for CPR after being trained using simulation method gain 88,40 as the average value. The result indicates such a very good value based on the regulations for evaluating learning outcomes by the minister of education and culture of the Republic of Indonesia [14]. The skill of the dominant respondents is included in the competent category. This finding indicates that simulation method is effective for the training and it is successful to enhance the students' CPR skill. According to Rismawan *et.al.* (2017), this method can increase CPR knowledge and skill since its process helps the trainees to understand clearly for every step that must be done. Simulation method is trained using a tool. It employs a mannequin as a life-sized doll to represent a human body. Accordingly, this kind of training can provide trainees such a convenient technique to figure out and to perform CPR as the first aid.

**The Differences of Using Visual (Poster) Method and Simulation Method on the Students' CPR Skill**

Tabel 5 The Differences of Using Visual (Poster) Method and Simulation Method on the Students' CPR Skill

| Group | Mean | St.Dev | Min-Max | p-value |
|---|---|---|---|---|
| Simulation | 88,4000 | 13,97319 | 50-100 | 0,001 |
| Visual (Poster) | 76,6000 | 13,59534 | 45-100 | |

The data above was analyzed by the use of Mann Whitney test. The result is*p-value* 0,001<α=0,05, thus it concludes that there is a difference between visual (poster) method and simulation method on the CPR skill of the students in SMKN 1 Banjarbaru. The average result from both group show 88.40 for the simulation group that is higher than visual (poster) group which gaining 76,60. It is because training using simulation method helps the respondents to figure out clearly the steps in doing CPRso that it successfully enhances their skill better compared to what they get from visual (poster) method.

This research finds out that simulation method is better to improve students' CPR skill. It is in line with Rismawan *et.al.* (2017) who stated that training process using simulation method could increase CPR skill of the respondents appropriately rather than using audiovisual method [15]. Simulation method facilitates trainees to perform the action directly after observing the example done by the trainer [16]. The study of Jin Wang *et al.* (2014) mentioning that to teach CPR skill through training or simulation method is such an effective way to improve a person's ability to rescue other who suffered from OCHA [17]. Learning CPR by doing the steps directly will provide the traineesto comprehend the action better rather than by only reading and looking at the pictures given. It isdue to the fact that learning through the help of visual (poster) material will be difficult to be understood especially by people with vision problem and those with aural and physical learning styles. Moreover, if the images presented are unclear, it will trouble the learning process [18].

Based on the observation done in this research, visual (poster) group encountered difficulty in either estimating the depth of the compressions or reversing for the full condition of the chest during performing CPR if they only learned it through poster. Meanwhile, it is different from simulation group who were provided by obvious depth of the compressions and how to get full reversion of the chest after the compressions. The study conducted by Soika *et.al.* reported that learning by practicing will be easier to be comprehended rather than by only reading. Besides, people who have lazy character tend to avoid understanding information requiring high concentration [19].

## 4. Conclusion

CPR skill of the students in SMKN 1 Banjarbaru after being trained using visual (poster) method is 76,60 and simulation group gain88,40 for the average value. It concludes that the average value of simulation group is higher than the value obtained from visual (poster) group regarding the students' skill to perform CPR. Can be used a reference in providing learning using visual methods (poster) or simulation methods to improve the skills to perform CPR.

## 5. Research Limitation

The research was conducted in SMKN 1 Banjarbaru. The limitation that appeared during research was about the population which were 56 respondents and there were 3 persons who were absent during the experiment given. In addition, the room used for the research was uncomfortable due to the hot weather. Moreover, the floor was not really clean that affected the focus of the respondents during the study.

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