UDC 614

THE EFFECTIVENESS OF DEMONSTRATION METHODS ON THE SKILLS OF ADOLESCENTS AS BYSTANDER CPR

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ABSTRACT
In 2016, the World Health Organization (WHO) recorded 7.2 million deaths worldwide due to cardiovascular disease with cardiac arrest. The incidence of cardiac arrest outside the hospital killed more than 350,000 lives per year with the survival rate <10%. Handling cardiac arrest cannot only be focused on health workers but also on the community. Adolescents as part of the community can become a bystander CPR so that mastery needs to be given through demonstrations. This study is taken to understand the effectiveness of a demonstration to improve the skills as bystander CPR. The method used in this study is Quasi-Experimental with Interrupted Time Series (Repeated Measure) design. Whereas, the bivariate test used is Wilcoxon. The study was conducted in Plesungan Village, Karanganyar Regency, with a sample of 30 adolescents. The results of the data analysis show that before and right after the demonstration, the p-value is 0.000 while 2 weeks after the demonstration, the p-value is 0.003. Nevertheless, 2 weeks and 4 weeks after the demonstration, the p-value is known to be 0.010. Statistically, because the p-value is <0.05, it can be concluded that the demonstration method is effective to improve the adolescents' skills as bystander CPR. The use of appropriate media can improve an individual's ability to learn CPR. The opportunity to demonstrate directly is proved to be able to improve the skills of adolescents in conducting CPR.

KEY WORDS
CPR, bystander CPR, cardiac arrest, heart attack, adolescents.

The data from the World Health Organization (WHO) in 2016 recorded that there were 7.2 million deaths worldwide due to cardiovascular disease. In Europe, 66 of 100 deaths of cardiovascular disease are associated with the incidence of heart attacks and cardiac arrest (Steg, James, Atar, Badano, Lundqvist, Borger, *et al.*, 2012).

Cardiac arrest is a medical condition in which the heart stops pumping the blood throughout the body. A cardiac arrest requires immediate life support or Cardiopulmonary Resuscitation (CPR). In 2015, American Heart Association (AHA) in the Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care emphasized the focus of CPR on the Chain of Survival that is known as Early Recognition and Activation by conducting an immediate introduction to cardiac arrest conditions and activating the Emergency Medical Response (EMS), giving CPR promptly, performing defibrillation immediately, conducting further life assistance effectively, and providing post-cardiac arrest care that is integrated with the hospital. (Cheung and Winston, 2006). The entire chain of survival in patients with cardiac arrest involves the basic ability in handling cardiac arrest patients for the first time by providing basic life support at the scene (AHA, 2015).

From OHCA victims, different safety variations are found. This is partly due to the different levels of bystander CPR which is an important link in increasing the survival for OHCA victims. There is a possibility of life extension in every 30 people who receive CPR from a bystander. At present, after five decades of medical progress, bystander CPR is the most important component in saving the victims of out-of-hospital cardiac arrest (OHCA) (Leong, 2011).

Adolescents are a special population in a potential community, having a role as the spearhead of a country's progress and development both in terms of economic, social, and health. Most of these adolescents spent their time mingling in the society which then gives

them the opportunity to act as bystander CPR in the case of OHCA. The above phenomenon raises the fact of the importance of CPR ability for people in general as well as for medical personnel.

One of the efforts to improve CPR capacity in adolescents is done through counseling that makes demonstration a learning method. It is expected that this method can ease the adolescents to understand and observe directly the basic life support performed by the model (Thoyyibah, 2014).

Thoyyibah (2014) examined the effect of basic life support or CPR training on adolescents towards the motivation level to help the victims of cardiac arrest. It is shown that their motivation levels increased along with the increased skills in handling CPR.

On the other hand, Onyeso (2016) observed the retention of CPR skills in high school students and found that there is an increase in the skills after training and skills retention 1 month after training.

A preliminary study conducted on 5 adolescents who are the members of adolescents Ingasrejo Plesungan revealed that there had never been counseling and demonstration in handling the cardiac arrest. Therefore, a further study was carried out. The results pointed out that there were some residents who experience a sudden death but the community recognized it as “cold seated” or “*masuk angin duduk*”. The cases of cardiac arrest and/or heart disease have never received attention from health workers and residents in general. As a result, the adolescents still feel unfamiliar with that term and how to handle it.

Based on the above phenomena and the urgency in preparing adolescents as individuals who are suitable to be called as bystander CPR, researchers are interested in studying more about the role of demonstration in improving the skills as bystander CPR.

The purpose of this study is to analyze the method of effective demonstration for the skills of adolescents as bystander CPR.

MATERIALS AND METHODS OF RESEARCH

The method used in this study is Quasi-Experimental with Interrupted Time Series (Repeated Measure) design. This study was conducted in Plesungan Village, Karanganyar Regency. The research was carried out by making a preliminary data collection and giving a demonstration of CPR. The first post-data collection was done on July 28, 2018, whereas the second post-data was made on August 11, 2018, and the third post-data was obtained on August 25, 2018. This study is quantitative research which used one group pretest-posttest design. It examines two variables, namely demonstration method as the independent variable and the CPR skill as the dependent variable.

The samples used amounted to 30 people. Moreover, the data normality test was performed by using Shapiro Wilk. On the other hand, the bivariate test was conducted using Wilcoxon because the data is not normally distributed.

RESULTS AND DISCUSSION

The assessment of initial CPR ability or basic life support on adolescents is done before the demonstration. Based on the Table 1 above, the minimum value obtained from 30 respondents is 15 while the maximum value is 30. The average value obtained by respondents is 22.83.

Table 1 – Skills before giving a demonstration

N	Mean	Maximum	Minimum
30	22.83	30	15

Cardiopulmonary Resuscitation (CPR) or also called as basic life support covers link 1, link 2, and link 3 in the chain of survival. On the other hand, link 4 and link 5 represent the provision of advanced life support. Everyone can be a helper to victims who experience a sudden cardiac arrest (AHA, 2015).

Before the demonstration, each respondent received a duration of 2-4 minutes to do a hands-only CPR. Duration is the time used by participants in carrying out CPR which in this case is set at 5 cycles or about 2 minutes. AHA (2010) recommended that every 2 minutes of CPR action, there must be an evaluation of the patient's carotid pulse with a gap of no more than 10 seconds (Sutano, Ratnawati, Suharsono, 2015).

The ability to do CPR before the respondents receive CPR material or demonstration is generally low because respondents have never gotten prior knowledge about CPR and bystander CPR (Naadir and Huriah, 2017).

Bystander CPR is a CPR done by friends, family members, or anyone who is able to help if a person is in a collapsed and unresponsive state (Pennsylvania Department of Health., American Heart Association., Heart Rescue Project Pennsylvania, 2013).

Youth or adolescents who are easily motivated and learning fast and in a period of development on body size, strength, psychology, and reproductive ability are expected to become a bystander in their environment. The low pre-test results with the average value of respondents by 22.83 can be the initial capital for adolescents to become a bystander CPR.

Table 2 – Skills after the demonstration

N	Post1	Post2	Post3
Mean	88.67	83.67	80.00
Minimum	70	65	65
Maximum	100	100	95

During the research process, respondents received the material concerning the role of bystander CPR and hands-only CPR live demonstrations. The skills of the respondents in conducting CPR are increased after the demonstrations were given.

Based on the Table 2 above, it can be seen that there is a decline in the value after the demonstration that is by 88.67 while 2 weeks after the demonstration it becomes 83.67. 4 weeks after the demonstration, the value is known to decrease again that is by 80.00.

The research from Naadir and Huriah (2017) explored the effectiveness of role-play and video methods in education and pointed out that it has a significant influence on improving the skills of the respondents. Roleplay is one form of simulation learning where demonstrations are carried out in the distribution of teaching material (Wang, Ma, Lu, 2015). As a teaching method, simulation can be interpreted as “how to present the learning experience using artificial situations to understand certain concepts, principles, or skills” (Suderajat, 2012).

The results of this study are also in line with previous research conducted by Wibawa (2012) who wanted to know the differences in demonstration methods with video playback on increasing the knowledge and attitudes of elementary school children in eradicating DHF. From the research, it is obtained that the value of post-test in the group given the demonstration is higher than the value in the group that was only given the video.

This can be understood because when receiving a demonstration, individuals will immediately get concrete experience about something. The learning process will be more effective if it is assisted with teaching aids directly rather than only looking through a video or listening passively. According to Notoadmojo (2010), a person's success in receiving new information is influenced by the way they obtain that information. Knowledge and skills are derived from the experiences of one's mind. A person who gets information from reading will only absorb 10% of the information obtained. While someone who gets information by saying and performing information will have 90% of the experience.

Table 3 – Skills before and after the demonstration

n/n	Pre x Post1	Post1 x Post2	Post2 x Post3	Pre x Post2	Pre x Post3
Z	-4.800[a]	-3.013[b]	-2.574[b]	-4.794[a]	-4.798[a]
Asymp. Sig. (2-tailed)	.000	.003	.010	.000	.000

Of 30 respondents based on the Table 3 above, it can be seen that the value of pre and post 1 right after the demonstration from Wilcoxon test results is p = 0.000. Because the value of p is <0.05, there is a significant difference in knowledge before the demonstration and after the demonstration.

The next column also shows the difference in value right after training and the value 2 weeks after training (p = 0.003). Statistically, this shows that there is a significant difference in knowledge right after the demonstration and 2 weeks after the demonstration.

Whereas, the other column presents the comparison of value on post 2 (2 weeks after demonstration) and 4 weeks after the demonstration with a value of p = 0.010. Statistically, it explains that there is a significant difference in the knowledge 2 weeks after the demonstration and 4 weeks after the demonstration.

In the next column, it can be seen that there is a difference in the value of CPR skills before the demonstration and 2 weeks after the demonstration with a value of p = 0,000. Statistically, this indicates that there is a significant difference in the values before the demonstration and 2 weeks after the demonstration.

The last column displays the difference in the value of adolescent CPR skills as bystander CPR before the demonstration and 4 weeks after the demonstration with a value of p = 0,000. This points out that there is a significant difference in the values before the demonstration and 4 weeks after the demonstration.

Based on the above description, it can be concluded that the demonstration method is effective to improve the skills of adolescents as bystander CPR. As shown in the statistical test analysis, the skills of the respondents were increased right after the training but continued to experience a slight decrease in 2 weeks and 4 weeks after the demonstration was given.

Thoyyibah (2014) who examined the effect of basic life support training (CPR) on adolescents towards the level of motivation to help the victims of the cardiac arrest showed that the motivation levels of the treated group also increased along with the improved skills of the adolescents in handling CPR. The factor that can influence the high level of motivation of adolescents in this study is learning. The learning process can provide knowledge for adolescents. The more someone learns or knows something, the more he/she will be motivated to behave according to what he/she has learned. Therefore, knowledge and level of motivation have a close relationship.

Skills are the results of repeated training accompanied by progressive or increasing changes from the people who learn the skills as a result of certain activities. Skill means capable and competent in completing tasks. The skills acquired by adolescents are technical skills. Technical skills are the ability to use the tools, procedures, and techniques related to the field (Sukiarko, 2007).

Many phenomena have shown that pulmonary heart resuscitation skills decrease over time. This is in line with the results of the study where the average value of respondents was decreased from the assessment after the demonstration by 88.67 followed by the decrease 2 weeks after the demonstration by 83.67 and 4 weeks after the demonstration by 80.00.

Research from Janti (2010) using the AHA Guideline showed that 21% of the training participants were able to demonstrate adequate pulmonary heart resuscitation skills immediately after the course and only 9% able to do the action well after three months. Another study which involved two treatment groups of medical students (the first group consisted of 56 subjects of medical students with 6 months reevaluation period while the second group consisted of 36 students with 12 months reevaluation period) revealed that CPR ability decreased significantly in both groups (Ju *et al,* 2012).

Besides that, there is a study on 12 emergency unit residents where the subjects underwent Basic Life Support training followed by periodic written and practical evaluations. The subjects carried out the written and practical tests right after the training and then 1 week, 2 weeks, 1 month, and 4 months after the initial training. The results indicated that the motor skills of the subjects fall faster than the knowledge. This decline began to be identified 1 week after the training was conducted (Gloria, 2011). Therefore, it can be said that the

cognitive abilities generally last longer more than the psychomotor abilities. It declines rapidly even 2 weeks after the training (Kim, Cho, Cho, Kyung, Han, and Lee, 2017).

Another study which was designed by administering CPR/AED training and followed by an evaluation 4 hours, 6 weeks, and 6 months after the training showed a value of CPR skills degradation by 23.7% 4 hours and 6 weeks after the training. Meanwhile, the difference between 4 hours and 6 months after the training was 26.8%. The decline in the 20 weeks after training was not more than 3.1%. This clarifies that the CPR skills experienced a decrease over time. After a 6-week decline, the value of the decline will be smaller (Nijhuis *et al*, 2012).

The research from Laksono (2015) which analyzed the influence of adult pulmonary CPR training on the retention of knowledge and adult pulmonary CPR skills in students presented a difference in the student skills after the provision of training through CPR video and demonstrations. The results pointed out a significant increase in the value of knowledge and skills from before and after the provision of CPR training. However, 2 weeks after the training, there was a decline in the value of knowledge and skills. 2 weeks and 4 weeks after the training with video and CPR demonstrations, the value of the skills tended to be relatively stable.

Ideally, CPR training for people in general needs to be done by using various methods to optimize the understanding of the skills learned. According to the theory of Dale, if there are more senses optimized to receive information from the outside, the perception of that person in receiving the information will be wider. This will shift the perception of the person, from abstract to more concrete (Sutono, Ratnawati, Suharsono, 2015). This also can be seen in the respondents of this study. During the lecture of material, respondents tended to be less active but began to be active at the start of the demonstration session. Respondents seemed to be more enthusiastic in direct practice.

George and Doto (2001) said that there are five factors that will affect the results of health education or psychomotor training to individuals, namely: the ability of each individual, not optimal demonstration, inappropriate feedback when the demonstration took place, affective individual, and individual perceptions. The abilities of respondents in this study are very diverse. Seen from the assessment, the value of each respondent is not the same because the level of education also varies.

Overall, after the demonstration was given, the average score of participants experience an improvement. The use of appropriate media can improve an individual's ability to learn CPR. The use of the case method and direct practice is proven to be able to improve the skills of adolescents as bystander CPR.

CONCLUSION AND SUGGESTIONS

The minimum value before being given a demonstration is 15 while the maximum value is 30. The average value obtained by the respondents is 22.83.

The average value right after the demonstration is 88.67 with a minimum value of 70 and a maximum of 100. On the other hand, the average value 2 weeks after the demonstration is 83.67 with a minimum value of 65 and a maximum value of 100. 4 weeks after the demonstration, the average value is known to be 80.00 with a minimum value of 65 and a maximum value of 95.

Before the demonstration and right after the demonstration, the effective demonstration method to improve the skills of adolescents as bystander CPR has a p-value of 0.000. Whereas, the p-value after the training and 2 weeks after the training is 0.003. It is also obtained that 2 weeks and 4 weeks after the demonstration, the p-value is 0.010. Because the p-value is <0.05, it can be said that the demonstration method can improve the skills of adolescents as bystander CPR.

Suggestions:

- For Health Workers and Government in the Area. The local government and health workers are expected to improve the socialization of heart disease and its

management by providing basic life support (CPR) as the first treatment for patients with cardiac arrest;

- For Adolescents. Adolescents are expected to play an active and confident role as bystander CPR in maintaining public health in the area of Mojorejo Ingasrejo Plesungan

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