Training adult laypeople in basic life support to enhance knowledge and confidence

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Abstract

Background: The lack ability of community to provide first aid to victims who experience cardiac arrest is due to their lack of knowledge and skills. Adolescent to adult age group has good potential to be involved in efforts to provide resuscitation for Out-of-Hospital cardiac arrest (OHCA) cases.
Purpose: To determine the effect of training adult laypeople in basic life support to enhance knowledge and confidence
Method: A quasi-experimental study with 1 pre and post-test group with a total sample of 30 members of youth organizations taken with total sampling technique.
Results: There was an increase in respondents' knowledge by an average of 58.89 from the initial knowledge with an average score of 30 (poor) to 88.89 (good). The results of statistical calculations using the Wilcoxon Signed Rank Test with a level of significance (α) 0.05 showed that calculated W value smaller than W table and the p value 0.000 smaller than α 0.05. There was also an increase in respondents' self-confidence of performing BLS from an average of 43.67 (less confident) to an average of 88.00 (very confident) after BLS training. Calculated W value is smaller than W table and p value 0,000 smaller than α 0.05.
Conclusion: BLS training has a significant effect on the knowledge and self-confidence level of respondents. There is an increase in the level of knowledge and confidence of respondents in the age group of adolescents and young adults to perform resuscitation after receiving BLS training.

Keywords: Basic Life Support (BLS); Confidence; Knowledge; Laypeople; Out-of-Hospital Cardiac Arrest (OHCA)

INTRODUCTION

Cardiac arrest is a non-functioning heart condition that occurs in a person who has heart disease or who does not. Cardiac arrest can occur suddenly or resemble other symptoms. Cardiac arrest can be fatal and lead to death. The causes of cardiac arrest are generally due to malfunctions of the cardiovascular system, due to disturbances in the heart's electrical system, causing abnormal heart rhythms, such as ventricular/atrial tachycardia, ventricular/atrial fibrillation. But some are also due to a weakened heart rhythm (Indonesian Cardiovascular Specialists Association, 2018).

Cardiac arrest is the leading cause of death in the United States. Cardiac arrest attacks that occur at home account for 70% and about 50% are not witnessed. Around 10.8% of adult patients who received life support from emergency medical service personnel survived to discharge from the

hospital, while patients who were able to survive after receiving treatment at the hospital were higher at 22.3% to 25.5 % (Khoirini & Esmianti, 2020). Meanwhile, according to data in Indonesia, the incidence of heart disease is 1.5% and sudden cardiac arrest occurs between 300,000 to 500,000 incidents annuall (Indonesian Cardiovascular Specialist Association, 2018; Ministry of Health of the Republic of Indonesia, 2019).

Cardiac arrest can occur anytime and anywhere, both inside the hospital and outside the hospital or known as Out-of-Hospital Cardiac Arrest (OHCA) (Olasveengen, et al., 2020). The vast majority of cardiac arrests occur outside the hospital, and the odds of surviving cardiac arrest decrease by 7-10% every minute since the onset of cardiac arrest (Kusumawati & Jaya, 2019). Out-of-hospital cardiac arrest (OHCA) is one of the leading causes of death and disability in the world and contributes to 10% of total deaths in developing countries. More than 80% of heart disease occurs in low- and middle-income countries. The incidence and survival rate due to cardiac arrest outside the hospital are still uncertain due to weak data collection and research in this field (Mawani, Kadir, Syed, Mehmod, & McNally, 2016). A study conducted in Pakistan in 2016 report that all patients with cardiac arrest outside the hospital could not survive. This was due to poor emergency medical services (EMS) or in Indonesia known as Public Services Center (PSC) services and the lack of efforts to initiate community awareness in order to strengthen the network contained in the chain of survival (Mawani, Kadir, Syed, Mehmod, & McNally, 2016; Ting, et al., 2020. The longer the patient gets first aid, the less likely the victims to survive.

Patients with cardiac arrest outside the hospital need help from anyone who is nearby during an attack (bystander) (Kusumawati & Jaya, 2019; Shirakawa, et al., 2020). Strengthening the chains of survival will be able to increase the survival rate up to 93.6%. Ordinary people play a major role in being a bystander in conducting BLS until eMS assistance arrives (Rahagia, 2019; Kusumawati, Sutono, Alim, Achmad, & Putri, 2023). The adolescent age group is considered to have good enough potential to be involved in efforts to provide BLS in community. This group showed good enthusiasm in aiding after being given BLS training (Mulyadi & Katuuk, 2017; Jensen, et al., 2022). This is in line with a study at Regional Public Hospital Dr R. Koesma, Tuban, East Java Province in 2016 which stated that resuscitation training and education in cardiac arrest was able to increase confidence in providing resuscitation (Ferianto, Ahsan, & Rini, 2016).

Karang Taruna is a youth organization in Indonesia formed by the community as a forum for the younger generation to develop themselves, grow, and develop based on awareness and social responsibility from, by, and for the younger generation, which is oriented towards achieving social welfare for the community. Karang Taruna consists of young men and women aged 11-45 years (Ministry of Social Affairs of the Republic of Indonesia, 2005). This study aims to describe the level of knowledge and self-confidence of members of a local youth organization about BLS and the effect of BLS training in their knowledge and confidence.

RESEARCH METHOD
This research was reviewed and approved by an independent ethics committee of Medika Suherman University Indonesia on September 10, 2021 (No: 165/V/B/UMS/IX/2021). The research was conducted in the village of Pasir Gombong, North Cikarang, Bekasi District, West Java, Indonesia in November 2021. The design of this study is a quasy experimental with one group prepost test study. The population in this study were members of the youth organization in Pasir Gombong Village, North Cikarang, Bekasi District, West Java which is totalling 30 peoples male. The sample was taken with a total sampling method. Participants who participated in less than 80% of activities, had a history of chronic or serious illness, or were pregnant were excluded from the research sample.

The data used in this study is secondary data taken from pre-test and post-test questionnaires. The instruments in this study were simulated mannequins/victims and mats for BLS training, as

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well as pre-test and post-test questionnaires to measure the level of knowledge and self-confidence of the respondents.

Knowledge level questionnaire contains 20 questions related to cases of cardiac arrest and BLS. This questionnaire already reliability and validity tested with r count> 0.444 and validity test value is 0.909. Each correct answer weighing 1. Total respondents' answers are then categorized as low (<56% correct answer), moderate (56-75% correct answer), and high (75-100% correct answer) level of knowledge. The self confidence questionnaire contains 20 questions about self-confidence and weighted answers from 1 to 5 that reflect agreement about the statement in the questionnaire. The total respondents' answers were then categorized as not confident (NC), lack of confidence (LoC), confident (C), and very confident (VC).

The data was obtained from the results of the pre-test and post-test questionnaire sheets. Once collected, the data was processed manually by grouping the results from the questionnaire sheets that were distributed and then analyzed using a statistical test processing program. After that it is processed using a computerized system. Data analysis in this study included univariate and bivariate analysis. Univariate analysis was performed to describe each variable. While bivariate analysis was carried out to find the relationship between the two variables, namely using the Wilcoxon signed rank test with a significance degree of 95% (α 0.05).

RESEARCH RESULTS

The training participants are members of the Karang Taruna of Pasir Gombong Village, totaling 30 persons. All training participants (100%) were male with age range of 21-51 years with an average age of 34 years. Most of the participants were between 21-35 years old (73.3%). The complete description of the characteristics of the training participants is presented in table 1 below.

Table 1. Characteristics of Participants (N=30)

Characteristics	Results
Age (Years Old) (n/%)	
Mean ±SD (Range)	34±9.93 (21-51)
21-35	22/73.34
36-45	4/13.33
>45	4 /13.33
Education Levels (n/%)	
Junior high school	22/73.33
Senior high	8/26.67
Employment status (n/%)	
Employee	8/26.67
Unemployed	22/73.33

Before starting the training, participants were given a pre-test about knowledge of cardiac emergencies and BLS and after the training materials were given, participants were given a post-test. All participants showed increased knowledge about cardiac emergencies and BLS as described in table 2 below. From the data, it was found that there was an average increase in knowledge of BLS training participants by 58.89 from initial knowledge with an average value of 30 (low) to 88.89 (high).

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Based on the statistical calculations using the Wilcoxon Signed Rank Test with a significance level (α) = 0.05, the calculated W value are 0.000 smaller than the W table. So, it can be concluded that there are significant differences in the level of knowledge of respondents before and after receiving BLS training. The results of the calculation of p value 0.0006 <α 0.05, so it can be concluded that BLS training has a significant effect on the level of knowledge of the respondents.

The training participants were also given a pre-test and post-test about their confidence in doing BLS. It was found that there was an increase in participants' self-confidence from an average of 43.67 (lack of confidence) to an average of 88,0 (very confident). We performed statistical calculations on the self-confidence data of 30 respondents using the Wilcoxon Signed Rank Test with a significance level (α) = 0.05. The calculation results show that the calculated W value is 0.000 smaller than the W table, so it can be concluded that there is a significant difference in self-confidence before and after the BLS training. The result of calculating the p value is <0.00004 which is smaller than the α value of 0.05. This means that the BLS training has a significant effect on the confidence of the respondents. The complete data is presented in Table 2.

Table 2. Evaluation of Knowledge and Confidence (N=30)

Variables	Mean	SD	Median (Range)	Wilcoxon	p value
Knowledge					
Pretest	30.00	10.89	33.33 (16.67-50)	0.000	0.0006
Post test	88.89	11.65	83.33 (66.67-100)		
Average Change	58.89	8.31	66.67 (50-66.67)		
Self-confidence					
Pretest	43.67	8.39	45.00 (30-70)	0.00	<0.00004
Post test	88.00	3.55	90.00 (80-95)		
Average Change	44.33	6.45	45.00 (25-55)		

We examined further the self-confidence data changes of the respondents specifically to see the level of confidence in carrying out some important actions in the BLS series. The BLS actions series are consist of 4 important actions as follows: perform the "3 Safety" preparation (environmental safety, safety for the rescuers, and safety for the victims); check the victim's response; make calls for help; and perform hands-only CPR. Based on the data we obtained, the highest increase in self-confidence level after the BLS training is the confidence to perform call for help. Meanwhile, the smallest change in confidence level is the confidence in doing hands-only CPR. Complete data is presented in Table 3.

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Table 3. Confidence Levels in Performing Basic Life Support (N=30).

Variables	Level of Confidence	Pretest n (%)	Post test n (%)
Confidence in performing the "3 Safety" preparation (environmental safety, safety for the rescuers, safety for the victims)	NC	6 (20.00)	0 (0)
	LoC	20 (66.67)	0 (0)
	C	4 (13.33)	8 (26.67)
	VC	0 (0)	22 (73.33)
Confidence checks the victim's responses	NC	26 (86.67)	0 (0)
	LoC	2 (6,67)	0 (0)
	C	2 (6,67)	6 (20.00)
	VC	0 (0)	24 (80.00)
Confidence in performing "call for help"	NC	8 (26.67)	0 (0)
	LoC	22 (73.33)	0 (0)
	C	0 (0)	0 (0)
	VC	0 (0)	30 (100.00)
Confidence in performing hands-only CPR	NC	29 (96.67)	0 (0)
	LoC	1 (3.33)	28 (93.33)
	C	0 (0)	2 (6.67)
	VC	0 (0)	0 (0)

* NC: Not Confident; LoC: Lack of Confidence; C: Confident; VC: Very Confident.

DISCUSSION
The level of knowledge

Based on pre-test and post-test data on knowledge of cardiac emergencies, it was found that there was an average increase in knowledge of BLS training participants by 58.89 from initial knowledge with an average value of 30 (low) to 88.89 (high). This is in accordance with previous studies involving groups of adolescents in BLS. This group of teenagers showed good enthusiasm in aiding after being given BLS training. Respondents, who are generally ordinary people, have limited knowledge about cardiac emergencies and BLS (Khasaba, Alharbi, Alghunaim, Alsemari, & Almohaimeed, 2021). There are even rumors circulating in the community that have not been scientifically proven. With the provision of knowledge about cardiac emergencies and BLS by experts, respondents claimed to have a better understanding of cardiac

emergencies and BLS. Basic Life Support (BLS) training for the laypersons is considered important by various countries in the world to increase knowledge about cardiac emergencies and resuscitation (Chang, et al., 2017). Increased knowledge can increase public awareness and responsiveness to cardiac emergency events that occur around them (Urban, Thode, Stapleton, & Singer, 2013).

The level of confidence

Based on the participants' self-confidence pre-test and post-test data, it was found that the level of self-confidence increased by 44.33 points from the average self-confidence value of 43.67 to 88.0. Likewise, a study at Dr R. Koesma Hospital, Tuban in 2016 which said that resuscitation training and education in cardiac arrest was able to increase

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confidence in providing resuscitation (Ferianto, Ahsan, & Rini, 2016).

It was found that the level of self-confidence of participants increased the most in self-confidence in making calls for help. Twenty two participants (73.3%) stated that they initially lacked confidence and 8 participants (26.67%) not confident in calling for help. After they receiving the training materials, 30 (100%) participants stated that they were very confident. This is because participants initially did not know when there was a medical emergency, such as cardiac arrest, they had to immediately contact adequate medical assistance such as PSC 119. Even from the results of in-depth discussions from participants, no one knew about the existence of PSC 119's roles and functions. So far, the local community still relies on ambulance assistance from the Social Service and uses private transportation.

There was an increase in participants' confidence to perform the "3 safe" preparation, which are safety environment, safety for the rescuers, and safety for the victim. Initially, most of the participants 20 (66.67%) stated that they lacked confidence in moving victims. This is because the experience that participants have experienced and the information they get, often in cases related to police cases, such as victims of accidents or acts of violence, people who initially want to help become troubled because of having to be willing to be witnesses and worry if they are involved in legal cases. This can be bridged by involving the role of PSC 119 which has been integrated with the Police. So, it is hoped that people who already have the desire to help will no longer hesitate.

Participants' confidence to check the victim's response also increased. Twenty six participants (86,67%) initially stating they were not confident in checking the victim's response. After being given training, 6 participants (20%) expressed confidence, while the remaining 24 participants (80%) stated that they were very confident. This is because participants who are ordinary people do not know what to check to find out if someone is experiencing cardiac arrest or not (Kusumawati, Sutono, Alim, Achmad, & Putri, 2023). Generally, when they meet

someone with a medical emergency, they are just guessing. So many cases that are found in the community are brought too late to adequate health facilities due to a lot of wasted time. In the training, information was given that to check the victim there were no actions that hurt or intervened in the victim's condition, and this was carried out within 30 seconds. If the check is carried out, it will not interfere with the victim's health condition. If within 30 seconds after carrying out 3 sequences of checking consciousness, checking breathing, and checking pulse, the participant still has doubts about the results of the examination, the participant can take a stance to declare the victim has cardiac arrest or an emergency. They can proceed to the next action, which is a call for help and hands-only CPR.

The smallest change in confidence level was in performing hands-only CPR. This is in accordance with research conducted in Malaysia and Australia which reported that the more often a person received BLS training, the more knowledge and confidence he would have in performing CPR. (Karuthan, et al., 2019; Bray, et al., 2017). In this study, only 1 (3,33%) respondent had received BLS training before, while the remaining 29 (96,67%) respondents had never been exposed to information about cardiac emergencies and BLS.

Basic Life Support (BLS) training for the laypersons is considered capable of increasing the knowledge and confidence of the common people to carry out resuscitation in cases of cardiac arrest that occur outside the hospital (Wingen, et al., 2018). Simply structured BLS training and sustainable is expected to build community awareness and responsiveness to cardiac emergencies events that occur in their surroundings (Beskind, et al., 2016). In addition, health policy, especially in the emergency sector, also plays an important role in building public awareness (Lee, et al., 2013).

CONCLUSION

Knowledge of cardiac emergencies and BLS among members of youth organizations significantly increases after receiving BLS training. The self-confidence to perform BLS of the youth organization

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members significantly increases after receiving BLS training.

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