SIMULATION TRAINING OF LAYER CARPULMONY RESUSCITATION ON SELF-EFFICIENCY IN SOCIETY

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ABSTRACT

This study aims to determine the effect of lay cardiopulmonary resuscitation simulation method training on self-efficacy in the management of lay cardiopulmonary resuscitation in the community. The method used is a one-group pre-post test design with convenience sampling. The results showed that the significance value of self-efficacy before and after the intervention was 0.001 (p-value <0.05). In conclusion, there is an effect of layman's CPR simulation training on community self-efficacy. This training can be an alternative for health workers to increase people's self-efficacy beliefs in CPR.

Keywords: Self Efficacy, Cardiac Arrest, Community, Cardio Pulmonary Resuscitation

INTRODUCTION

Cardiac arrest is the interruption and loss of cardiac function, usually characterized by a palpable carotid pulse, dyspnea, and decreased consciousness. Most heart attacks occur at home and often go unnoticed. The incidence of heart attacks in the US reaches 359,400 people and is an emergency (Berutu & Silalahi, 2022; Yasin et al., 2020). The rate of heart attacks in the United States is known and documented as high as 250,000 per year, and an estimated 95% of people die before reaching the hospital. Meanwhile, in Indonesia, there is no statistical data on the number of confirmed cases of cardiac arrest. The annual event has an estimated 10,000 residents. Cardiac or cardiac arrest is a life-threatening emergency that can cause death if not treated immediately. Out-of-hospital cardiac arrests occur at home and elsewhere during surgery (Kistan & Najman, 2022).

In Indonesia, there is no precise data regarding the incidence of cardiac arrest in everyday life or outside the hospital. However, an estimated 10,000 people annually, or 30 per day, experience cardiac arrest. Patients with coronary heart disease experience most events. Deaths from cardiovascular disease, especially coronary heart disease, and stroke, are expected to continue to increase to 23.3 million deaths in 2030 (Etlidawati & Miliana, 2021)—activities to reduce mortality and losses due to heart attacks. The path of activism is continued by providing training in handling cardiac arrest to increase one's knowledge and skills in seeking help to help others, parishioners, and medical personnel. Skills developed for early detection of signs of cardiac arrest, CPR, performing defibrillation, and teamwork are the best ways to help each other achieve BHD. They are conditions to which employees must respond when assisting cardiac arrest victims (Abilowo & Lubis, 2022).

Emergencies can happen anywhere; many think home is the safest place. Many dangers and risks are included in emergencies that lurk in the community environment. In dealing with it, efforts are needed to restore and maintain the function of vital organs, commonly called Basic Life Support (BHD). These BHD skills can be taught to anyone, not only health workers but also the general public or so-called lay people (bystanders) (Fahrurroji et al., 2020). Often, people who first find victims of cardiac arrest (ordinary people) are hesitant to take Basic Life Assistance (BHD), especially Cardio Pulmonary Resuscitation (CPR), for fear of being sued for doing "wrong" for injury (even accidentally) or causing death. Therefore, the role of nurses in emergency services as educators (educators) of emergency nurses acts as a provider of education or clinical guidance for patients and families to improve health and prevent recurrent or non-occurring injuries.

Out-of-Hospital Cardiac Arrest (OHCA) is an out-of-hospital cardiac arrest event, a significant health problem globally, with an average annual incidence of 55 per 100,000 adults (Qodir, 2020). A study conducted in America showed that up to 70% of Out-of-Hospital Cardiac Arrests (OHCAs) or cardiac arrests outside the hospital occurred at home, and almost 50% were not witnessed (Milindasari, 2022). Meanwhile, the incidence of cardiac arrest ranges from 10 out of 100,000 ordinary people under age 35, reaching around 300,000-350,000 events annually (Oktarina, 2019). The results of the causes of death collected by the Puskesmas in the city of Bandung throughout 2020, cardiac arrest is included in the top 10 causes of death in the city of Bandung, with 11 cases of death recorded or 1.23% recorded (Bandung et al. Office, 2021).

A preparedness system is needed so that the community plays an active role in responding to emergencies. The City of Bandung, RW, is on active standby with 1,551 in 2020. The fourth indicator of RW is active alert with a community-based emergency and disaster preparedness system, so the people involved are even more active in emergencies. A preparedness system is needed so that the community plays an active role in responding to emergencies. In Bandung, the status of RW is on active alert, totaling 1,551 in 2020. The fourth indicator of RW is active alert with a community-based emergency and disaster preparedness system, so the people involved are even more active in emergencies (Bandung et al. Office, 2021).

Early treatment that is not carried out becomes morbidity and mortality with cardiac arrest; first aid is correct, namely by carrying out Basic Life Assistance. Following the American Heart Association data, 40.1% of victims of OHCA incidents can be saved after receiving CPR by a layman (bystander). CPR is a series of actions to restore optimal function of the respiratory and circulatory systems. The intervention consists of giving chest compressions as soon as possible until health workers arrive. The timing of starting CPR increases the chances of adequate recovery of the body. Start CPR in less than 4 minutes after a heart attack because if it is not treated immediately, it can cause death (Putri & Sidemen, 2017).

According to Aziz et al. (2020), ordinary people or lay helpers are the factors that support the survival of people who experience cardiac arrest outside the hospital. Helpers who are not medical personnel are called lay helpers. Lay helpers are expected to be able to recognize the symptoms of cardiac arrest and seek immediate medical assistance in person or through social media. In addition, the American Heart Association (AHA) recommends that the general public be able to start CPR quickly and accurately if provided an Automated External Defibrillator (AED) can

use it until an emergency team of medical personnel arrives to take over to save the lives of victims of cardiac arrest.

Someone who will do CPR quickly and precisely must be accompanied by increased knowledge in BHD training. Following previous research (Qodir, 2020), training significantly improves laypeople's basic life support knowledge and skills. In addition to increasing knowledge with BHD training, it must also be accompanied by self-confidence. With less self-confidence, even though the knowledge is good, the possibility of acting will be complicated (Ambarika, 2017). Therefore, self-efficacy is needed in essential life support as an initial belief to carry out CPR. However, self-efficacy related to CPR is rarely carried out, and knowledge generally increases.

Self-efficacy is a belief in a person's ability to do something or overcome a situation that will succeed. Someone with high self-efficacy believes that they can do something to help and provide assistance; for example, if a cardiac arrest occurs around a residence that requires emergency treatment, handling essential life support is a necessity to maintain the life of someone whose life is being threatened (Ambarika, 2017). To determine the low and high self-efficacy that a person has, it can be determined by the dimensions of self-efficacy consisting of magnitude, strength, and generally. (1) Magnitude is the difficulty level of a task that is believed to be able to carry it out. (2) Strength in this dimension refers to an assessment of the level of strength and weakness of self-efficacy. (3) Generally, this domain is related to self-efficacy in all domains in similar activities, which means that individuals are confident in their abilities (Wilandika & Ibrahim, 2016).

Therefore, efforts to increase CPR simulation training are urgently needed to improve layman's CPR skills. Providing CPR action simulations to ordinary people is very important to do. It helps to increase the number of people trained in lay CPR actions to become bystanders in the community and increase self-efficacy in ordinary people in carrying out lay CPR actions. Thus this study aims to determine the effect of lay CPR simulation method training on self-efficacy in the management of lay CPR in the community.

RESEARCH METHODS

This pre-experimental analytical study uses a one-group pre-post-test design from June to July 2022. This research design involves a group of subjects that are measured at the beginning before being given an intervention; then, measurements are retaken after the intervention. The intervention provided in this study was training in group simulation methods to see changes in self-efficacy in managing lay Cardio Pulmonary Resuscitation (CPR) in the community.

The sample in this study is community members who live in one of the sub-districts in the city of Bandung, with as many as 42 people. The sample size was determined using the paired categorical analytic formula with an anticipated dropout of 10%. The sampling technique applied is convenience sampling. Respondents who meet the inclusion criteria and are willing to participate in the research will be asked to complete a questionnaire and follow a series of training processes. The inclusion criteria include: 1) productive age 15-64 years; 2) have the ability to read and write; and 3) have never received CPR training. At the same time, the exclusion criteria in this study were respondents who could not attend or were sick during the research process.

The intervention applied was training in a cardiopulmonary resuscitation simulation method. Layman's CPR simulation method training is a series of CPR training by non-specialists which is carried out using a simulation method that was previously delivered with a lecture related to the CPR concept accompanied by a speaker, following the essential life support (BHD) guidelines by the American Heart Association (AHA) 2020. Training Series carried out for 110 minutes in one meeting. The tools and materials used in this training include basic life support mannequins, projectors, and laptops. The training was carried out by providing material on lay CPR management for 20 minutes, then continued with a demonstration of lay CPR management using a BHD mannequin for 20 minutes. After the demonstration, the training participants were divided into six small groups, where one group consisted of 7 participants. Each group was given a BHD mannequin; each participant practiced the CPR management stages for 10 minutes. During the implementation of this simulation, one trainer was supervising and providing direction in the implementation of CPR accompanied by a team of 3 members. Trainers are experts in emergencies, and the team is health workers who work in the scope of emergency nursing and have competence in providing basic and advanced life support. To avoid injury and fatigue, each training participant is monitored. If it is seen that a participant is tired, the simulation is stopped, and the participant is asked to rest.

In this study, self-efficacy measurements were carried out in lay CPR management before and after the intervention. Self-efficacy in lay CPR management is an individual's belief in his ability to perform first aid in life-threatening cardiac arrest with CPR actions. Efficacy was measured using the Cloud CPR Management Self-Efficacy Questionnaire developed by researchers. This questionnaire consists of 17 question items which are grouped based on the dimensions of self-efficacy, namely: 1) the dimension of the magnitude or level of difficulty performing ordinary CPR (6 items); 2) the dimensions of strength or strength of belief in performing lay CPR (7 items); 3) general dimensions or areas of confidence in performing initial CPR (4 items). Question items used a 4-point Likert scale with the answer choices of strongly agree, agree, disagree, and strongly disagree, and the measurement results were categorized into high, medium, and low. The Cloud CPR Management Self-Efficacy Questionnaire has been declared valid and reliable. Emergency nursing experts from one of the central hospitals in Bandung tested this questionnaire for content validity. It was declared fit to be used as an efficacy measure for the general public. Besides that, regarding construct validity and reliability, this questionnaire has a Pearson Correlation (R) validity value between 0.378 to 0.764. At the same time, the reliability value of Cronbach's Alpha from this questionnaire is 0.808.

In this study, demographic characteristics, including age, gender, education, marital status, occupation, experience of attending lay CPR training, and self-efficacy, were displayed through descriptive analysis using frequency and percentage distributions. Meanwhile, inferential analysis using the Wilcoxon Sign Test was used to assess the effect of lay CPR simulation training interventions on self-efficacy scores before and after training. This study has also received ethical approval from the University of 'Aisyiyah Bandung Research Ethics Committee with number 131/KEP.01/UNISA-BANDUNG/VI/2022 (14 June 2022).

124

RESEARCH RESULT

Table. 1
Community Characteristics and Correlation with Self-Efficacy Management
Lay Cardiac Pulmonary Resuscitation (n=42)

Characteristics of Respondents	Frequency	Percentage (%)	Self Efficacy (*p-value*)
Age			
Age range 16 - 64 years Average age: 43.38	-	-	0,396
Gender			
Woman	19	45,2	0.,510
Man	23	54,8	
Last education			
Elementary school	8	19	
Junior high school	6	14,3	0,450
Senior High School	25	59,5	
College	3	7,1	
Work			
Housewife	12	28,6	
Government employees	7	16,7	0,025
Self-employed	6	14,3	
Laborer	17	40,5	
Marital State			
Marry	32	76,2	0,670
Not married yet	8	19	
Widower widow	2	4,8	
Had lay CPR training			
Yes	0	0	-
No	42	100	

Based on table 1, it can be seen that the people involved in this study were in the age range of 16 - 64 years, with an average age of 43.38 years, and the majority were male (54.8%). Most of the people's education level is at the high school level (59.5%), with almost half of them working as laborers (40.5%), and most of them are married (76.2%). The people who participated in this study had never received cardiopulmonary resuscitation training for ordinary people (100%).

In addition, based on the correlation test of community characteristics with self-efficacy in managing cardiopulmonary resuscitation, it is known that people's jobs have a relationship with self-efficacy with a significance value of 0.025 (p-value <0.05).

Table. 2
Results of Wilcoxon Sign Test Analysis of CPR Simulation Method Training
on Self-Efficacy in Layman CPR Management on Society (n=42)

Self Efficacy	Average Score (mean ± SD)	f	%	Wilcoxon Non Parametric Test pretest-posttest	
				Z	Sig. (2-tailed)
Pretest					
Low		1	2,4		
Currently	2,79 ± 0,470	7	16,7	-5,568	0,001
Tall		34	81		

Posttest			
Low		0	0
Currently	$2,95 \pm 0,216$	2	4,8
Tall		40	95,2

Table 2 shows the effect of test results using the Wilcoxon Sign Test on the self-efficacy of lay CPR management in the community. Based on the test, a significance value of 0.001 was obtained (p-value <0.05). So, there is an effect before and after being given training on cardiopulmonary resuscitation simulation methods on increasing self-efficacy in the community. Based on the assessment of the average self-efficacy score before and after the training, there was an increase of 0.16, where the mean pretest score was 2.79 ± 0.470, increasing to 2.95 ± 0.216 in the post-test score. Changes in self-efficacy categories also show that at the time of the pretest, most people have a high level of self-efficacy, as many as 34 people (81%), while during the post-test, 40 people have high self-efficacy (95.2%). This shows an increase between the pretest and post-test by (14.2%) (table 2).

DISCUSSION

The research results on the effect of training in lay cardiopulmonary resuscitation simulation methods on increasing self-efficacy in the community show a significant effect. In general, low and high self-efficacy in a person in carrying out actions can be determined by three dimensions of self-efficacy: magnitude, strength, and general. Based on the frequency analysis results and different tests, all domains of self-efficacy affect lay CPR simulation method training. Therefore, the community can be sure they can take action by administering lay CPR to cardiac arrest victims outside the hospital. Incidents of cardiac arrest outside the hospital occur at home and other places during activities (Berutu & Silalahi, 2022; Kistan & Najman, 2022).

Providing Cardio Pulmonary Resuscitation (CPR) in cardiac arrest patients is a significant key to restoring the patient's life. Per the recommendations of the American Heart Association (AHA), patients experiencing OCHA need community support to provide help. Therefore, efforts to increase capacity and knowledge about the importance of Cardio Pulmonary Resuscitation (CPR) actions must be carried out for ordinary people (Yunanto, 2017), explaining that training is essential in implementing quality CPR because training can increase knowledge and quality CPR. The introduction of Cardiac Pulmonary Resuscitation (CPR) can be done as a prevention of the worsening of the patient's condition before or after the occurrence of respiratory arrest and cardiac arrest. Prevention is a series of efforts and anticipations that must be considered before treating cardiac or respiratory arrest. Prevention will give far better results than cardiopulmonary resuscitation (Kusumawati & Jaya, 2019). The research results on adolescent knowledge about cardiopulmonary resuscitation related to adolescent self-efficacy in Malang state that the level of knowledge about CPR is still shallow, so it is necessary to hold collaborative CPR training for adolescents (Yasin et al., 2020).

Research conducted by Ro et al., (2016) shows that CPR can help cardiac arrest patients outside the hospital who are unconscious in the community. However, it requires training experience and high self-efficacy to perform CPR. Factors that support the survival of people who experience cardiac arrest outside the hospital are

ordinary people or lay helpers. Helpers who are not medical personnel are called lay helpers. Lay helpers are expected to be able to recognize the symptoms of cardiac arrest and seek immediate medical assistance in person or through social media. In addition, the American Heart Association (AHA) recommends that the general public can start CPR quickly and accurately; if an automated external defibrillator (AED) is provided, it can be used until an emergency team of medical personnel arrives to take over to save the lives of cardiac arrest victims (Aziz et al., 2020).

Public health efforts, including CPR health promotion and training programs, should target increasing public awareness, training experience, and self-efficacy to increase the implementation of lay CPR by the community and improve out-of-hospital cardiac arrest survival outcomes (Ro et al., 2016). The training conducted in this study used a simulation method to perform CPR actions on BHD mannequins by providing material and demonstrations by the trainer, then continuing with the simulation one by one of the participants performing CPR actions.

Simulation is one method widely used to teach CPR to non-professionals or professionals. CPR simulation training directly supervised by certified instructors is the only training method recognized in Indonesia today. Training participants will receive a formal certificate as a training participant. The advantage of this method is that it is more interactive, and the audience can ask questions directly to the facilitator, but this method requires much time and a large area to do this method (Herlina et al., 2018). Thus, the implementation of this simulation is considered capable of increasing knowledge which has an impact on increasing self-efficacy in performing CPR skills in the community.

Nursing students' high self-efficacy for CPR may be related to several things. One of them is that students are prospective health workers who have been taught knowledge and skills on how to do CPR during their education, so they tend to get used to dealing with these conditions (Wati et al., 2021). High self-efficacy can also increase self-confidence to act calmly and focused (Nastiti et al., 2021; Desiani et al., 2017). Self-efficacy is a belief in a person's ability to do something or overcome a situation that will succeed. Someone with high self-efficacy believes that they can do something to help and provide assistance; for example, if a cardiac arrest occurs around a residence that requires emergency treatment, handling essential life support is a necessity to maintain the life of someone whose life is being threatened (Ambarika, 2017).

Emergencies can happen anywhere; many think home is the safest place. Many dangers and risks are included in emergencies that lurk in the community environment. In dealing with it, efforts are needed to restore and maintain the function of vital organs, commonly called Basic Life Support (BHD). These BHD skills can be taught to anyone, not only health workers but also the general public or so-called lay people (bystanders) (Fahrurroji et al., 2020). Often, people who first find victims of cardiac arrest (ordinary people) are hesitant to take Basic Life Assistance (BHD), especially Cardio Pulmonary Resuscitation (CPR), for fear of being sued for doing "wrong" for injury (even accidentally) or causing death. Therefore, the role of nurses in emergency services as educators (educators) of emergency nurses acts as a provider of education or clinical guidance for patients and families to improve health and prevent recurrent or non-occurring injuries.

Research by Fitri et al. (2023) found that almost all respondents had never attended training because they needed to learn about BHD training. However, most respondents had a desire to learn about BHD and had a desire to disseminate information about BHD if they received education about BHD. Previous research has also found something similar; young people are very good at obtaining extensive information, including the consequences of cardiac arrest events outside the hospital, and young people can recognize the importance of early CPR (Jiang et al., 2020). Other research has also found that the age group of students influences peers in learning about CPR, and high school students can be trained to become CPR instructors and teach their peers about CPR well (Damvall et al., 2022). Popularizing bystander CPR knowledge and skills among students is one meaningful way to increase access to CPR (Mao et al., 2021).

Self-efficacy is an individual's belief or belief in the ability possessed in carrying out and completing the tasks at hand so that they can overcome obstacles and achieve the desired goals, which is characterized by the presence of confidence in overcoming uncertain situations, confidence in achieving targets, belief in cognitive abilities, foster motivation and be able to overcome existing challenges (Andriyani & Werdani, 2021). Someone who has high self-efficacy will be able to complete tasks in several fields. In contrast, someone with low self-efficacy will tend to complete their tasks in a few fields. Self-efficacy can predict the ability to complete tasks and feel ready with one's abilities and motivation for the future (Andriyani & Werdani, 2021). Thus, community members who have received CPR training and believe and are confident in carrying out these actions when they meet a person having a cardiac arrest will consciously help save that person until help from health workers arrives at the scene of the cardiac arrest.

The attitude that a person has will affect his performance (Karyus et al., 2019). The formation of the attitude of Nasyiatul Aisyiyah cadres in implementing the STOP stunting program can be influenced by internal factors and external factors. One of the influential internal factors is self-efficacy (Aithal & Aithal, 2019). Self-efficacy is an individual's belief or belief in the ability possessed in carrying out and completing the tasks at hand so that they can overcome obstacles and achieve the desired goals, which is characterized by the presence of confidence in overcoming uncertain situations, confidence in achieving targets, belief in cognitive abilities, foster motivation and be able to overcome existing challenges. One of the study's results shows that self-efficacy has a positive and significant effect on positive attitudes, including team member job satisfaction (Indriyani et al., 2020). Other research explains that self-efficacy is related to implementing postpartum exercises at the Tunas Bunda Polindes. Motivational abilities and skills in postpartum mothers can provide a positive attitude to develop for the better (Indriyani, 2015).

This research has limitations. Limitations in the implementation of this research, namely the determination of research time, must adjust to the free time of the community. In this study, the intervention was carried out according to the community members involved so that the choice of time, which was considered to have an impact on the process of receiving information, could not be achieved optimally. Even so, the intervention strives to remain effective and run following established standard procedures.

CONCLUSION

The effect of training on layman's cardiopulmonary resuscitation simulation method significantly increases the community's self-efficacy. The study results showed an increase in the self-efficacy of ordinary people in the category of high self-efficacy. High self-efficacy has implications for ordinary people to be confident and able to perform ordinary CPR on cardiac arrest victims. The results of this study are an option for conducting training to improve CPR skills for ordinary people by paying attention to the self-efficacy of the community.

SUGGESTION

The simulation method training strategy can be used to educate the public to increase self-efficacy in lay CPR management because training using the simulation method is suitable and easy to give to the lay community. It is also hoped that efforts to improve CPR skills for the community can be carried out massively so that the community's resilience and capacity to be actively involved in managing cardiac arrest victims outside the hospital will improve.

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