

Original Research Article

THE EFFECT OF SIMULATION OF THE BASIC LIFE SUPPORT TRAINING ON NURSING STUDENTS' KNOWLEDGE

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Abstract

Background: Cardiac arrest is a health problem that is increasing to be the leading cause of death in the world. The main action to save cardiac arrest aims to maintain optimal myocardial and cerebral oxygenation so that death does not occur. Providing Basic Life Support (BLS) is an effort to save and restore this function. Knowledge about cardiac arrest among health students is still a neglected problem due to a lack of awareness in seeking basic knowledge (Chandrasekaran et al., 2010).

Objective: This study aimed to determine the effect of basic life support-based simulation training on knowledge of nursing students in the city of Bengkulu.

Methods: This study used a pre-experimental design with a pre-test post-test approach. The population in this study were all 61 students of the fourth semester of STIKES Tri Mandiri Sakti Bengkulu nursing students. Samples were taken using total sampling technique. Data were collected using a knowledge questionnaire containing 10 question items which were adopted from the questionnaire Yunanto et al., (2017). The results of the reliability test on the knowledge questionnaire showed that $r_{\alpha} (0.768) > r_{\text{table}}$, so the knowledge questionnaire was declared reliable. Data were analyzed using paired sample t-test.

Results: Based on the results of the study, it was found that there was a significant effect of BLS training based on manikin simulation on nursing student knowledge with a value of $t_{\text{test}} = -15.169$, $p = \text{value} = 0.000 < \alpha = 0.05$.

Conclusion: Nursing students need to provide knowledge about BLS from the start so that they are more confident and able to apply it in case of cardiac arrest outside the hospital. Higher education institutions should provide health education about BLS from the beginning of the academic year, so that in the following semester students are better able to improve the quality of the skills they have formed.

Keywords: Basic Life Support, Knowledge, Simulation

INTRODUCTION

The highest mortality outside the hospital is usually due to cardiac arrest (Rahmawati et al., 2020). Research in the United States shows that 70% of heart attacks occur outside the hospital or Out-of-Hospital Cardiac Arrest (OHCA) (Putri & Sidemen, 2017). The incidence of cardiac arrest in Indonesia has no definite data. The main cause of cardiac arrest is cardiovascular disease. Riskesdas 2013 showed the highest prevalence of cardiovascular disease is CHD (Coronary Heart Disease) at 1.5% (Ministry of Health, Republic of Indonesia, 2014). Basic Life Support (BLS) is an action that can be done to sustain life from cardiac arrest (Hernando, 2016). The BLS skills for nursing students are very important because in the BLS there are basic techniques for saving victims (Hernando, 2016). However, student awareness about the BLS is still low. The presence of trained bystanders (helper) to special lay people such as students will determine the likelihood of surviving a life-threatening emergency (Pande et al., 2014). A cross-sectional study conducted by Chandrasekaran et al., (2010) regarding the BLS training for students showed that awareness of the BLS among medical students was still lacking, and knowledge of the BLS was not maximal, reaching 894 out of 1,054 respondents. In line with Almesned et al., (2014) regarding the knowledge of the BLS in a combination of health students, it shows that 69 out of 139 respondents get a low knowledge score, this means that knowledge about BLS in students is still lacking and needs to be improved.

Health education such as learning to use manikins (phantoms) is an effort that can be made to increase student awareness in learning of the BLS. It is intended that students are able to become helpers in times of emergency, both in the internal environment of the university and outside the campus. The BLS learning with simulations aims to improve cognitive abilities so that information can be absorbed properly (Setiawan et al., 2018). Simulation is a learning

activity in the form of health education which aims to provide a real picture to learners to mimic one activity shown (Retnawati, Widajanti, & Nugrahaeni, 2014). Manikin-based simulation (phantom), one of the methods used in clinical training, is very effective because it is able to show training participants in realistic scenarios (Surcouf et al., 2013). In addition, simulation-based training includes a continuum of technology aimed at training purposes (Salas, Wildman, & Piccolo, 2009).

Wayne et al., (2008) research on students trained in Advance Cardiac Life Support (ACLS) using a manikin simulator showed much higher adherence to AHA standards with an average correct response rate of 68% SD 20%). A similar study was conducted by Fatih & Rahmidar (2019), regarding the BLS training using a manikin simulator showing high satisfaction and trust in nursing students with an average score of 32.77 from the highest possible score of 40.

This study aimed to determine the effect of the basic life support-based simulation training on the knowledge of nursing students of STIKES Tri Mandiri Sakti Bengkulu.

METHODS

Study Design

This research was a pre-experimental study with a one group pre-test post-test approach.

Setting

The research was conducted at STIKES Tri Mandiri Sakti Bengkulu and was carried out in July-August 2020. The implementation time was carried out in July because it had entered the new period (new normal) COVID-19, and had received permission from STIKES Tri Mandiri Sakti to conduct direct research with respondent in class. The research was conducted for 8 days. Eight to seven respondents were gathered in class every day by implementing the Covid-19 prevention protocol, namely: students wash their hands at the sink in front of the class, check the

temperature before entering the room, use a face shield, masks, and seats are spaced 1 meter apart.

Research Subject

The research subjects were all of the students of nursing program of fourth semester of STIKES Tri Mandiri Sakti as much as 61 people with total sampling as the technique of collection. Researchers use the fourth semester because that semester has not received a course on first aid and has never attended the BLS training.

Instruments

Instruments are used to support the course of research. The tools used include: Manikin of CPR, LCD, laptop, knowledge questionnaire adopted from Yunanto, et al. (2017) containing questions about the actions of the BLS according to the recommendations of the American Heart Association (2015), the data scale uses ordinal with a score of 0-10. The results of the validity test on the knowledge questionnaire found that the valid questions were $r_{\text{result}} > r_{\text{table}}$ (0.44) for 10 out of 17 questions, is question number one until ten. The results of the reliability test on the knowledge questionnaire showed that $r_{\text{alpha}} (0.768) > r_{\text{table}}$, so the knowledge questionnaire was declared reliable.

Intervention

Data was collected before and after the treatment was given in the form of the BLS simulation. A knowledge questionnaire was administered prior to treatment. After filling out the questionnaire, students are given an in-depth study of the material from the researcher, the material is given by providing examples of simulations directly on the phantom. After the material session is over, the respondent's knowledge is measured again.

Data analysis

Data analysis used univariate and bivariate. The univariate analysis included knowledge, age and gender. Bivariate analysis to determine the effect of simulation on knowledge before and after training using the paired samples t-test. Bivariate analysis using t-test aims to determine differences in knowledge before and after basic life support training is given. Data were normally distributed using the Kolmogorov-Smirnov test with a pre-test value, $\text{sig} = 0.216$ and a post-test value, $\text{sig} = 0.110$.

Ethical Consideration

This research has received approval from the Ethics Commission of Poltekkes Kemenkes Bengkulu with letter number No. KEPK/062/06/2020.

RESULTS

Characteristics of Respondents

Table 1 Distribution of Frequency of Respondents by Age and Gender of the Students of Nursing Program of STIKES Tri Mandiri Sakti, Bengkulu, Indonesia at July until August 2020 (n = 61).

Characteristics	Frequency (n)	Percentage (%)
Age		
18-20 years	28	45.9
21-23 years	33	54.1
Gender		
Male	13	21.3
Female	48	78.7

Sources: Primary Data of Questionnaire, 2020.

Based on the research results in the table above, it was found that most nursing students were at the age of 21-23 years as many as 33 people (54.1%) and most of them were female 48 people (78.7%).

Determine of the Effect of the Basic Life Support-Based Simulation Training on Knowledge of Nursing Students in the City of Bengkulu using Paired T-Test

Table 2 The Effect of the Basic Life Support-Based Simulation Training on Knowledge of Nursing Students in the City of Bengkulu using Paired T-Test.

Level of Knowledge	Before being given a simulation		After being given a simulation	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Low	56	91.8	1	1.6
Enough	4	6.6	25	41
Good	1	1.6	35	57.4

t-test = -15,169, *p*-value = 0.000 < α = 0.05

Sources: Primary Data of Questionnaire, 2020.

Based on the research results in the table above, it was found that the level of student knowledge before being given simulation-based training was at a low level (91.8%). After being given simulation-based training, most students were at a good level (57.4%). This can give an idea that students' knowledge increased after being given BLS training based on manikin simulation (*t*-test = -15.169, *p*-value = 0.000 < α = 0.05).

DISCUSSION

This study shows that the respondents aged 21-23 years were 33 people. This age is a late adolescent category with an age range of 17-25 years (Amin & Juniati, 2017) and is considered capable of receiving critical information about BHD so that it is hoped that knowledge will have a positive impact (Nurvitasari, Jainurakhma, & Muhammad, 2020). The female gender dominates as respondents, this is in accordance with Amin & Juniati's (2017) research that most of the respondents who took part in the study were women as many as 45 people. Respondents' knowledge after being given training has increased. Knowledge about the BLS is very important for everyone to know, both health workers and ordinary people. Nursing students can be referred to as special lay people who must be able and have skills regarding BLS because

emergency events such as cardiac arrest can be found anywhere, including on campus. Research by Fadiyah, Agustina, & Illiandri (2019) shows that the level of knowledge of students who are given the BLS training has increased. A similar study by Setiawan et al., (2018) concluded that there were differences in the cognitive levels of nursing students before and after being given the BLS training.

The results of the *t*-test showed that there is a significant influence between simulation-based training on student knowledge. The BLS simulation using a simulator such as a manikin (phantom) is one of the methods used to increase knowledge. This simulation is widely used for health education clan. With the simulation-based technology, it is hoped that it can create competitiveness for college students in an effort to answer the constant challenges for patient care.

Simulation technique is one of the effective learning methods to prepare nursing students in real conditions in the hospital and outside the hospital while working. Research conducted by Wayne et al., (2008) revealed that simulation-based education programs significantly improve the quality of care provided to residents who attend training. Some evidence also shows that simulation is a useful addition for providing procedural training with traditional methods (Wayne et al., 2008). A similar study conducted by Fatih & Rahmidar (2019) provides information that student satisfaction using the low fidelity simulation in the BLS training is very high. Muniarti & Herlina (2019) also observed that the BLS simulation showed a significant effect on the motivation and knowledge of the training participants.

This study provides knowledge that the BLS training can improve the ability of nursing students who will later become a by-stander (helper) so that they are more confident in doing BLS optimally (Nurvitasari et al., 2020). Respondents used methods based on simulation of manikin well. Overall, the value or score of the ability to perform BLS has been improved after being given treatment following the 2015 American Heart Association (AHA) recommended BLS sequence (American Heart Association [AHA], 2015).

CONCLUSION

This study provides the benefits of good knowledge for participants because with basic life support training, special bystander such as nursing students are more confident and able to provide assistance in cases of cardiac arrest.

SUGGESTIONS

The limitation of this study is that researchers cannot monitor and evaluate students' abilities after being given training. The use of pre-experimental designs with control may be added to further research.

The research findings are expected to be the basis of evidence to take action and practice helping victims in emergency cardiac arrest conditions. This research can also be applied to ordinary people who have never received the BLS training, because the BLS technique can be applied to all levels of society other than students.

DECLARATION OF CONFLICTING INTEREST

There is no conflict of interest in this research.

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AUTHOR CONTRIBUTION

Ida Rahmawati: Conduct research and compile research articles.

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