

The Effect of CPR Multimedia Learning to Willingness of Nursing Students On Conducting CPR

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ABSTRACT

Introduction: Incidence of out-of-hospital cardiac arrest (OHCA) varies worldwide as does the survival rate. The willingness of bystander on performing CPR on OHCA victims is an important factor in improving survival rate. **Objective:** To analyze the effect of CPR multimedia learning to willingness of nursing students on conducting CPR. **Methods:** This research was a quasy experimental study with randomized subject, pretest-posttest without control group design. The number of respondents were 36 students of 6th semester of nursing student using purposive sampling technique. The data was collected using a willingness questionnaire. Location of this study was in STIKES dr. Soebandi Jember. Ethical approval has been obtained from the Health Research Ethics Committee at STIKES dr. Soebandi Jember. **Results:** The results showed that there were score differences of nursing students' willingness to perform CPR between before and after CPR multimedia learning ($p=0.000$). In the early stages before the CPR multimedia learning (pretest), the average respondent's willingness to reach 9.68 (4-5 questions answered yes) with the lowest score 8 and the highest score 14. After the CPR multimedia learning (posttest), the average respondent's willingness reached 14.13 (7-8 questions answered yes) with the lowest score of 12 and the highest score of 16. **Conclusion:** This study shows that CPR multimedia learning can increase the willingness of nursing students on conducting CPR.

Keyword: CPR, nursing student, willingness

ABSTRAK

Latar belakang: Insiden serangan jantung di luar rumah sakit (OHCA) sangat bervariasi di seluruh dunia begitupula tingkat kelangsungan hidupnya. Kesiediaan bystander dalam melakukan RJP pada korban OHCA merupakan faktor penting dalam meningkatkan kelangsungan hidup. **Tujuan:** Mengetahui pengaruh pembelajaran multimedia RJP terhadap kesiediaan mahasiswa keperawatan dalam melakukan RJP di STIKES dr. Soebandi Jember. **Metode:** Desain penelitian yang digunakan adalah quasy eksperimental dengan rancangan randomized subject, pretest-posttest without control group design. Jumlah responden sebanyak 36 mahasiswa semester 6 program studi ilmu keperawatan menggunakan teknik purposive sampling. Pengumpulan data dilakukan dengan menggunakan kuesioner kesiediaan. Lokasi penelitian di STIKES dr. Soebandi Jember. Persetujuan etik telah didapatkan dari Komisi Etik Penelitian Kesehatan di STIKES dr. Soebandi Jember. **Hasil:** Hasil penelitian menunjukkan bahwa terdapat perbedaan skor kesiediaan mahasiswa keperawatan dalam melakukan RJP antara sebelum dan setelah pembelajaran multimedia RJP ($p=0,000$). Pada tahap awal sebelum dilakukan pembelajaran multimedia RJP (pretest), rata-rata kesiediaan responden mencapai 9.68 (4 – 5 pertanyaan menjawab bersedia) dengan nilai terendah 8 dan nilai tertinggi 14. Setelah dilakukan pembelajaran multimedia RJP (posttest), rata-rata kesiediaan responden mencapai 14,13 (7 – 8 pertanyaan menjawab bersedia) dengan nilai terendah 12 dan nilai tertinggi 16. **Kesimpulan:** Penelitian ini menunjukkan bahwa pembelajaran dengan multimedia RJP dapat meningkatkan kesiediaan dalam melakukan RJP..

Kata Kunci: CPR, Mahasiswa Keperawatan, Kesiediaan

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Introduction:

Out-of-hospital cardiac arrest (OHCA) is a cardiovascular emergency that is the leading cause of mortality worldwide (Myat et al., 2018). The annual incidence of OHCA in the United States as reported by the ROC Registry in November 2015 was 347.000 cases in adults and 7.037 cases in children (Mozaffarian et al., 2016). Japan Utstein-style has also conducted a survey in 2005-2012 stating that there were 925,288 cases of OHCA in Japan including pediatric and adult patients (Kitamura et al., 2012). While in Indonesia there is still no specific data related to OHCA. However, in 2008 it was estimated that 17.3 million deaths were caused by heart disease, where the incidence is expected to continue to increase to reach 23.3 million deaths by 2030 (*Riset Kesehatan Dasar*, 2013).

OHCA has a poor prognosis in the United States was reported to have a survival rate of 12% compared to the OHCA survival rate in China which was still less than 1% (Xu et al., 2017). OHCA survival to hospital discharge in 2014 after nontraumatic EMS-treated was 12.0% and survival after bystander-witnessed was 38.6% for patients of any age in the ROC Epistry (Mozaffarian et al., 2016). Survivors of OHCA who receiving early initiation, good cardiopulmonary resuscitation (CPR) quality, and the use of an automated external defibrillator (AED) significantly improved survival and long-term outcomes (Xu et al., 2017).

Layperson who is not part of organized emergency-response system who provide emergency CPR are known as bystanders CPR. Nursing students are an important community to provide first aid to OHCA victims, namely CPR as a CPR bystander (Chocron et al., 2021). Improving the ability of CPR bystanders in helping cardiac arrest victims plays an important role in overcoming OHCA so that CPR training is needed for the general public. With the presence of bystander CPR, neurological outcomes and survival rates of OHCA patients can be improved (Akahane et al., 2012). Methods and media in providing

training must be considered to increase the knowledge, skills, confidence, and willingness of nursing students to perform CPR. (Bobrow et al., 2013) explained that the use of multimedia in providing CPR training is recommended to increase knowledge and skills in adolescents. As bystander CPR is associated with survival after OHCA, it is important to identify people willing to perform CPR (Y. Wulansari & Wirasakti, 2022). The purpose of this study was to determine the effect of CPR multimedia learning to willingness of nursing students on conducting CPR at STIKES dr. Soebandi Jember.

Methods:

The research design was a quasi-experimental study with a pretest-posttest without control group design. The number of respondents were 36 of 6th semester of nursing student STIKES dr. Soebandi Jember with a total sampling technique. The inclusion criteria for the study were students who had received lectures in Emergency Nursing I. The exclusion criteria were students who had received CPR multimedia lessons. The research location at STIKES dr. Soebandi Jember. Time of research in July – August 2021. Data collection was carried out using a willingness questionnaire which was developed based on research conducted by (Y. W. Wulansari, 2017) which had been tested for validity and reliability. The categories of data collection carried out by questionnaires were in the form of positive responses and negative responses which were interpreted as willing and unwilling. Responses that can be given by respondents are in the form of statements "yes" with a value of 2, and "no" with a value of 1. The data scale used in the willingness variable is an interval scale with a range of values between 8-16. Ethical approval has been obtained from the Health Research Ethics Committee at STIKES dr. Soebandi Jember with No.101/KEPK/SDS/IV/2019. Researchers conducted a pretest at the first meeting which included filling out a questionnaire on willingness to perform CPR. At the second meeting, the researcher gave

learning about CPR through a demonstration method with multimedia CPR, where in this model learning visualization of CPR explanations and actions will be displayed through the display of text, images, animation, audio and video within 20 minutes. At the third meeting, the researcher conducted a posttest using a questionnaire on the willingness to perform CPR to the respondents. The researcher used descriptive analysis (frequency and percentage) to calculate the variable of nursing students' willingness to perform CPR before and after learning Multimedia CPR. Pretest and posttest data on the willingness variable with a numerical data scale with a numerical comparative hypothesis type in 2 paired groups were tested by the Friedman test because the data were not normally distributed. The confidence interval used is 95% to compare the willingness of nursing students to perform CPR before and after the intervention.

Results:

Table 1. Age characteristics of participants

Variable	Mean (SD)	CI 95%
Age	21.39 (0,60)	19 – 21,59

Data on the characteristics of respondents based on age shown in table 1 shows that the average respondent is 21 years old

Table 2. Gender characteristics of participants

Variable	Frequency (n)	Percentage (%)
Gender		
Male	7	19,4
Female	29	80,6
Total	36	100

The data on the characteristics of respondents based on gender shown in table 2 above shows that most of the respondents are women as many as 29 (80.6%) respondents.

Table 3. Score Differences of nursing students' willingness on conducting CPR based on scores give the answer "yes" (willing)

Willingness	Mean (SD)	Min	Max	CI 95%	<i>p</i>
Pretest	9,68 (2,23)	8	14	9,11 – 10,26	0,000
Posttest	14,13 (1,10)	12	16	13,85 – 14,42	–

Friedman test. P value post hoc Wilcoxon: Pretest vs Posttest 1 = 0,000

In table 3 above, it can be seen that the *p* value <0.05 where there is a difference in the willingness score between before and after CPR multimedia learning. At the initial stage before the training (pretest), the average willingness of the respondents was 9.68 (4 – 5 answered yes) with the lowest score of 8 and the highest score of 14. After the training (posttest), the average willingness of the respondents reached 14.13 (7 – 8 answered yes) with the lowest score 12 and the highest score 16. Further analysis was carried out to determine the willingness of respondents on conducting CPR in more depth, which is shown in table 4.

Table 4. The difference of willingness (answering questions with choices of will)

Willingness	Pretest n (%)	Posttest n (%)	<i>p</i>
Known people			
Family members	11 (30,6)	33 (91,7)	0,000
Friends	13 (36,1)	32 (88,9)	0,000
Dislike person	4 (11,1)	25 (69,4)	0,000
Unknown person			
Different gender	3 (8,3)	20 (55,6)	0,000
Accident victims	5 (13,9)	23 (63,9)	0,000
Children	11 (30,6)	32 (88,9)	0,000
Elderly person	11 (30,6)	31 (86,1)	0,000
Homeless person	1 (2,8)	22 (61,1)	0,000

$p < 0,05$ post hoc Wilcoxon: Pretest vs posttest

Based on table 4 above, it is known that in all components of the respondent's willingness to perform CPR on various victim conditions between before and after CPR multimedia

learning there are significant differences with p-value <0.05 .

Discussion :

The willingness of layperson on conducting cardiopulmonary resuscitation is influenced by proper knowledge of CPR, prior CPR training, and onsite bystander CPR assistance (Otani, T., Ohshimo, S., Shokawa, T., Nishioka, K., Itai, J., Sadamori, T., ... Tanigawa, 2011). In this study, where the respondents were 6th semester nursing students who had received knowledge and skill practice about performing CPR, most of them answered 4-5 questions with "yes" out of a total of 8 questions. This means that nursing students who only get lectures about CPR without any further training will hesitate to carry out CPR in the community when they have finished their education.

The willingness of nursing students on conducting CPR prior to training was found to be less than 40% who were willing to perform CPR on people they knew or on people they didn't know. This is similar to previous research conducted by (Holmberg et al., 2000) which explains that CPR observers who have received previous CPR training have a high level of self-confidence to further influence the willingness of ordinary people to perform CPR on OHCA victims. This is supported by (Sasaki et al., 2015) in their study which states that one of the main factors that greatly affects the confidence in performing CPR in lay people is having attended CPR training. (Chien et al., 2020) also explained that CPR training will result in increasing the willingness of ordinary people to perform CPR.

Knowledge, skills, self-confidence and willingness of layperson to perform CPR are strongly influenced by the learning model obtained when receiving information related to learning how to handle cardiac arrest victims (Y. W. Wulansari, 2017). There are several learning models that are used to provide information to someone, including lecture methods, discussions, demonstrations, the use of audio-visual media, etc. The use of these various models will of course also affect the

learning evaluation results of nursing students (Y. Wulansari & Wirasakti, 2022). The learning method used by the researcher is multimedia teaching. The multimedia teaching used is a video that is in accordance with the adult cardiac arrest simulation guide developed and in accordance with the American Heart Association (AHA) training. Video CPR simulates cardiac arrest treatment, such as: high-quality chest compressions using the recommended CPR rhythm, breathing assistance using a pocket mask and bag valve mask, as well as a comprehensive simulation from recognizing the signs of cardiac arrest to treatment.

The results of the statistical test of the willingness of nursing students to perform CPR after the multimedia learning of CPR (posttest), the average willingness of respondents to reach 14.13 (7 – 8 answered yes). (Cox, 2019) explained that learning media that encourages students to increase their willingness in taking an action starts from providing learning with the media they like, namely interesting pictures. This is in line with the training conducted by researchers using CPR multimedia learning media which displays simulations in the form of images and videos in performing CPR.

Willingness to perform CPR is the first step towards improving the chain of survival through bystander CPR. In our study, we found that 33 students (91.7%) who are willing to do CPR on family members, 32 students (88.9) on friends, 25 students (69.4) on dislike person, 20 students (55.6) on different gender, 23 students (63.9) for accident victims, 32 students (88.9) for children, 31 students (86.1) for elderly persons, and 22 students (61.1) willing to perform CPR on homeless persons. (Parnell et al., 2006) in a study on high school students found that the willingness to perform CPR on the family was 84%, while those who had the will to do it to strangers were only 63%. This is because the willingness of the community to provide assistance to victims is influenced by several factors including internal factors as well as external factors. Internal factors include the individual's human values, while examples of external factors include the willingness of other

helpers around the victim (Johnston et al., 2003). The unwillingness to perform CPR on unknown persons is the main factor that reduces the willingness of CPR bystanders to provide assistance to OHCA victims. Assumptions of a person to help can also be influenced by gender. In accordance with their traditional role as protectors, men are more likely to provide assistance than women, because men are considered stronger than women (Meier, 2007). However, the culture that develops in society that limits contact with the opposite sex is a factor that influences the willingness to help foreigners of the opposite sex. People's habit of avoiding touching or communicating with strangers of the opposite sex is contrary to the concept of CPR, where CPR itself requires touching the victim to help him (Hamasu et al., 2009).

The results showed that there were differences in the willingness scores of nursing students in performing CPR between before and after CPR multimedia learning. Likewise, the results of all components of respondents' willingness in conducting CPR between before and after training there was a significant difference, where in the willingness score after CPR multimedia learning was carried out, all question components experienced an increase compared to before the learning was carried out. This is in accordance with the statement of (Sasaki et al., 2015), namely the factors that affect a person's willingness in performing CPR, including having attended CPR training. (Boyle et al., 2014) in their study comparing animated video learning media with other learning media explained that animated videos work to help trainees understand knowledge and skills more easily than other media. Where knowledge and skills are the basis of a person in increasing his willingness. This is in line with the training conducted by researchers using CPR multimedia learning media. This is also supported by research conducted by (Chernobilsky & Granito, 2012) which also explains that technology that has components in the form of images, sounds, and motion animation has the advantage of being easy to remember by

someone so that it can increase motivation in taking action.

Conclusions:

The willingness of nursing students to perform CPR at STIKES dr. Soebandi Jember before and after learning CPR multimedia has increased and it can be concluded that there is a significant effect of CPR multimedia learning on the willingness of nursing students to perform CPR.

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