



## Differences in Offline and Online Learning Methods for Cardiac Pulmonary Resuscitation (CPR) Knowledge and Skills In Final Level Nursing Undergraduate Students

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Received: January 2022; Revised: May 2023; Published: July 2023

### Abstract

The survival rate in cases of cardiac arrest outside the hospital is still low, besides that the public's knowledge about CPR is still limited, and there is a critical time limit for performing CPR. Therefore, the role of lay people, including nursing students, in CPR is important. Improving the knowledge and skills of nursing students in CPR through effective learning methods, one of which is using offline and online methods. This study aims to see differences in learning methods between offline and online methods in increasing the knowledge and skills of Cardiac Pulmonary Resuscitation (CPR) in students of the Bachelor of Nursing Study Program, STIKes Utama Abdi Husada Tulungagung. This research is a quasy experimental research with a posttest only control design approach. The research sample consisted of 56 students who were divided into two groups. The research instrument used questionnaires and observation sheets with statistical tests using Mann Whitney. The results showed that learning methods using both offline and online methods could significantly increase respondents' knowledge about CPR ( $p=0.002$ ) but did not show a significant difference in respondents' skills in performing CPR ( $p=0.052$ ). The two learning methods both offline and online have their respective effectiveness, where the online method is more effective in increasing students' knowledge and skills on RJP.

**Keywords:** Cardiac Arrest, Cardio Pulmonary Resuscitation, Offline Learnig, Online Learnig

**How to Cite:** Purwacaraka, M. (2023). Differences in Offline and Online Learning Methods for Cardiac Pulmonary Resuscitation (CPR) Knowledge and Skills In Final Level Nursing Undergraduate Students. *Prisma Sains : Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, 11(3), 672-677. doi:<https://doi.org/10.33394/j-ps.v11i3.8097>

 <https://doi.org/10.33394/j-ps.v11i3.8097>

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## INTRODUCTION

Cardiac arrest is the main cause of death that often occurs throughout the world, including in developed and developing countries like Indonesia. Cardiac arrest generally occurs outside the hospital, which is called Out of Hospital Cardiac Arrest (OHCA) (Lactona, 2021). The OHCA survival rate is still low, around 12%. The main cause of the low survival rate is the delay in reporting and giving cardiopulmonary resuscitation (CPR) measures (Wnent et al., 2013). Data shows that more than 17 million people die from heart and blood vessel disease worldwide. In America, there are 2 million deaths from cardiac arrest outside the hospital each year, as well as in several Asia-Pacific countries, including Indonesia, as many as 60,000 OHCA events have been recorded (Muthmainnah, 2019). The general public often faces difficulties in recognizing the symptoms of cardiac arrest, so they usually contact the victim's family or close friends before calling for emergency medical assistance (Meischke et al., 2012),

Public knowledge about Cardio Pulmonary Resuscitation (CPR) is also still limited, and there is a critical time limit for carrying out CPR, which is only 10 minutes. Research by Yasin et al. in 2020 showed a low level of knowledge of CPR in several cities in East Java (Yasin et

al., 2020). Therefore, it is important to increase the role of laypeople in CPR by providing knowledge about CPR. The 2015 AHA also recommends increasing the role of everyone to become CPR bystanders in the community. Providing knowledge about CPR to everyone in the community will increase the number of CPR bystanders, enable rapid administration of CPR to cardiac arrest victims, and increase the survival rate of OHCA victims two to threefold (Hasselqvist-Ax et al., 2015). According to the American Heart Association (2015), lay people, including nursing students, have an important role in the survival chain system when treating victims of cardiac arrest. Nursing students can perform actions such as recognizing and activating the emergency response system, high-quality CPR and defibrillation as soon as possible (AHA, 2015). The role of nurse educators is expected to be able to make effective learning observations to support the educational process. This can be done through the use of creative learning media and discussions that lead to developing student abilities and increasing knowledge and skills, thus, the goal is to form students who are competent in their fields (Lactona, 2021).

One of the appropriate learning methods to improve students' CPR skills is the demonstration method (offline). According to Addiarto (2018) this method is considered very effective in increasing students' CPR abilities to the maximum (Addiarto, 2018). The effectiveness of this method lies in the fact that students are given individual opportunities to try directly practicing CPR, making it easier to understand and accept CPR material (Sharma & Sharma, 2017). Apart from the offline method as mentioned by Addiarto (2018), online learning methods using learning videos are also considered effective in CPR learning. This method uses visualization and clear descriptions to present CPR actions from start to finish. Thus, students can properly recall the material presented, thereby increasing their understanding of RJP (Addiarto, 2018).

Based on a preliminary study at the Hutama Abdi Husada Tulungagung STIKes Nursing Study Program, it was found that students' ability in RJP was still very low, where 60 final year students took the CPR practice exam, only 60% passed, and 40% took re-exams (remedial).. Pasaribu's research (2022) supports the fact that the public's knowledge, especially health students, regarding providing basic life support is still low. To increase this level of knowledge, BHD training can be followed. Factors such as age, information, education, and experience can affect a person's level of knowledge (Pasaribu, 2022). Given this problem, where students are still not able to improve CPR skills, it is hoped that changes in learning methods can improve CPR abilities in the future. This research focuses on solving the problem of cardiac arrest and improving out-of-hospital survival (OHCA). Delays in reporting and providing CPR actions and low public knowledge are the main factors for the low survival rate of OHCA. In this study, nursing students were involved to increase OHCA survival through their role in the survival chain system. Offline and online learning methods are compared to improve CPR knowledge and skills. The results of this study make an important contribution in increasing the knowledge and skills of nursing students as well as providing specific contextual insights in the Nursing Study Program STIKes Hutama Abdi Husada Tulungagung. Overall, this study encourages the empowerment of nursing students and the selection of effective learning methods to increase OHCA survival rates. Therefore, the purpose of this study was to compare the differences in the effectiveness of learning methods between the offline method in the form of demonstrations and the online method in the form of video demonstrations in increasing the knowledge and skills of Cardio Pulmonary Resuscitation (CPR).

## METHOD

This study uses a quasi experimental research design with a posttest only control design approach. The design of this quasi-experimental posttest only control design emphasizes the comparison of the treatment between the two groups, namely the control group and the treatment group, in which the treatment group is the group that is given special treatment, in this study the provision of offline demonstration learning methods, while the control group

does not receive treatment specifically only using online learning methods using CPR educational videos. This research was conducted at STIKes Hutama Abdi Husada Tulungagung on April 8-9 April 2023. The population and sample in this study were all final year students of the Bachelor of Nursing Study Program, STIKes Hutama Abdi Husada Tulungagung, totaling 56 students. Sampling by total sampling technique by taking the entire population and divided into 2 groups, namely 28 treatment groups and 28 control groups. Data collection used a knowledge questionnaire on Cardio Pulmonary Resuscitation (CPR) which was modified from Pasaribu's research (2022) on the Description of Student Knowledge About BHD (Pasaribu, 2022) and an observation sheet/checklist to assess the skills of each respondent based on the AHA (2015). After the data has been collected, a statistical independent t test is performed if the data is normally distributed but if the data is not normally distributed then the Mann Whitney statistical test is used. Tests were used to assess differences in CPR knowledge and skills of the two groups. This research has passed the ethical test number 57/KEPK-STIKESHAH/EC/III.S1/2023 from LPPM STIKes Hutama Abdi Husada Tulungagung

## RESULTS

The results of the descriptive analysis in this study indicate that there are differences in the level of knowledge about Cardio Pulmonary Resuscitation (CPR) in respondents who use the offline learning method with the dare learning method but there are no significant differences in skills about Cardio Pulmonary Resuscitation (CPR) in respondents who use the offline learning method with bold learning methods. The mean scores of the alluring and daring groups are listed in tables 2 and 3.

Table 1. Characteristics of Respondents

Characteristics of Respondents		Frequency	Percentage (%)
Age	21 Years	14	25
	22 Years	26	46,4
	23 Years	16	28,6
<b>Total</b>		<b>56</b>	<b>100</b>
Gender	Male	19	33,9
	Female	37	66,1
<b>Total</b>		<b>56</b>	<b>100</b>

Based on table 1 it shows that the majority of respondents were 22 years old, namely 26 respondents (46.4%) and the majority were female, namely 37 respondents (66.1%).

Table 2. Differences in Knowledge about Cardio Pulmonary Resuscitation (CPR) in the Offline Group and the Online Group

	N	Minimum	Maximum	Mean	Std. Deviation	P-Value
Offline Knowledge	28	67	100	79.46	8.892	0,002
Online Knowledge	28	75	100	87.21	8.736	

Based on table 2, it shows that the average value of the knowledge of respondents who use the offline method is 79 with a minimum value of 67 and a maximum value of 100, while the respondents who use the online learning method have a higher average value of 87 with a minimum value of 75 and a maximum 100. Based on the results of the analysis of the Mann Whitney statistical test, it shows that there are differences in the level of knowledge about Cardio Pulmonary Resuscitation (CPR) in respondents who use the offline learning method with the online learning method which shows a significance value of  $p = 0.002$  (Pvalue < 0.05).

So it can be concluded that online learning methods can significantly increase respondents' knowledge about Cardio Pulmonary Resuscitation (CPR).

Table 3. Differences in Skills of Offline Groups and Online Groups

	N	Minimum	Maximum	Mean	Std. Deviation	P-Value
Offline Skills	28	75	97	85.39	6.903	0,052
Online Skills	28	75	97	82.04	8.025	

Based on table 3, it shows that the average score of the skills of respondents who use the offline method is 85 with a minimum score of 75 and a maximum score of 97, while the respondents who use the online learning method have an average score of 83 with a minimum score of 75 and a maximum value of 97. Based on the results of the analysis of the Mann Whitney statistical test, it shows that there is no difference in skills regarding Cardio Pulmonary Resuscitation (CPR) in respondents who use the offline learning method with the online learning method which shows a significance value of  $p = 0.052$  ( $Pvalue > 0.05$ ). So it can be concluded that the learning method using both offline and online methods resulted in respondents' skills regarding Cardio Pulmonary Resuscitation (CPR) not showing a significant difference

## Discussion

Based on the results of the study, it was shown that there were differences in the level of knowledge about Cardio Pulmonary Resuscitation (CPR) in respondents who used the offline learning method with online learning methods which showed a significance value of  $p = 0.002$  ( $Pvalue < 0.05$ ), this was also evidenced by the difference in the average value -the average knowledge of the offline group and the online group which has a difference of 7.75. However, the results of the study also showed that there was no difference in skills regarding Cardio Pulmonary Resuscitation (CPR) in respondents who used the offline learning method with online learning methods which showed a significance value of  $p = 0.052$  ( $Pvalue > 0.05$ ). This is shown by the difference in the average skill score of the offline group and the online group which only has a difference of 3.35. So it can be concluded that the learning method using both offline and online methods can significantly increase the respondent's knowledge about Cardio Pulmonary Resuscitation (CPR) but does not show a significant difference in the respondent's skills in performing Cardiac Pulmonary Resuscitation (CPR).

The results of this study are in line with the research of Oktaviani and Fitriani (2022) which shows that the application of audiovisual learning has proven effective in increasing participants' knowledge, this is because the learning method that uses video case illustrations and BHD action steps raises curiosity and enthusiasm in participants so as to prevent boredom and increase participant interest (Oktaviani & Fitriani, 2022). Other research also states that the self-directed video (online) method has a positive side where participants can learn independently, can be done anywhere and anytime (Metrikayanto et al., 2018). According to Jenson, C., & Forsyth (2012), one of the innovative strategies in learning models using technology is the use of instructional videos that present real application concepts from nursing procedures or other nursing experiences in audiovisual form (Jenson & Forsyth, 2012). According to another study conducted by Addirto (2018) which stated that the demonstration method (luring) is more effective than the use of audiovisual media (online), especially in better psychological and psychomotor aspects. This is due to the fact that learning through demonstration provides an opportunity for respondents to directly try CPR material individually (Addiarto, 2018). According to Metrikayanto's research (2018) in method I (self-directed video), training participants have flexibility, but in skills when participants learn independently, it is difficult to identify the quality of the skills acquired (Metrikayanto et al., 2018)

In principle, offline and online learning have a similar level of effectiveness in increasing CPR knowledge and skills. The use of the online method (video) in teaching has been shown to be able to stimulate thinking and improve the student learning environment. The effectiveness of video media in learning provides variety in lessons, which allows students to develop understanding independently. This study showed that respondents actively paid attention to the video presented on the steps of Cardio Pulmonary Resuscitation (CPR), and organizing audio and visual information in memory was able to increase respondents' knowledge. However, demonstrations are slightly superior in the psychomotor aspect and create high self-confidence in respondents, where the facilitator can provide direct feedback to provide clarifications or corrections to the material presented. This is intended so that participants can correct deficiencies in the practice of these actions. However, unlike the simulation method, this method has limited flexibility and requires the presence of a mentor or trainer. Therefore it can be suggested to combine the two learning methods simultaneously, namely offline and online in order to maximize the participants' abilities

## CONCLUSION

The conclusion describes the answer to the hypothesis and / or the purpose of the research or scientific findings obtained. Conclusions do not contain repetitions of the results and discussion, but rather summarize the findings as expected in the objectives or hypotheses.

## RECOMMENDATION

Recommendations that can be given for further research are to provide online methods such as the use of smartphone applications to increase knowledge and skills in cardiopulmonary resuscitation bystanders.

## ACKNOWLEDGMENT

We thank the various parties who have helped carry out this research so that this research activity runs smoothly.

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