Vol. 7 No.1 (2025) Hal. 1-7

HealthCare Nursing Journal
available on : https://journal.umtas.ac.id/index.php/healtcare
e-ISSN : 2655-6812

Research Article

The Effect of Self-Directed Video on Compression Quality Using the Sikomjaru Phantom

Kurnia Aji[1], M. Hanif Prsetya Adhi [1*], Endiyono[1], Nurul Fatwati Fitriana[1]
[1]Nursing Department, Faculty of Health, Universitas Muhammadiyah Purwokerto, Indonesia[1]

Article Information

Received: 19 November 2024
Revised: 11 January 2025
Available online: 15 January 2025

Keywords

Cardiac arrest; CPR Hands Only; health cadres; SIKOMJARU

Correspondence

Phone: (+62)85600006609
E-mail: hanifprasetya01@gmail.com

Website

https://journal.umtas.ac.id/index.php/healtcare/index

Doi

10.35568/healthcare.v7i1.5603

ABSTRACT

Cardiac arrest remains a major concern in healthcare due to its high mortality rate, with more than 100 deaths annually worldwide and 5% occurring in Indonesia. One recommended first aid method is Hands-Only CPR. This study aimed to evaluate the effect of Self-Directed Learning videos on Hands-Only CPR using SIKOMJARU on the compression quality of Hands-Only CPR performed by community health volunteers in Kalisaleh Village. The study employed a quasi-experimental design with a total sampling technique, involving 40 participants who received identical interventions. Compression quality was assessed using the Hands-Only CPR SOP from the American Heart Association (AHA), performed on the SIKOMJARU CPR education phantom. Data analysis was conducted using the Wilcoxon test, yielding significant results with a p-value of 0.000. The findings demonstrated that Self-Directed Learning videos on Hands-Only CPR using SIKOMJARU were effective in improving the compression quality of Hands-Only CPR. This method offered an efficient educational solution to enhance the capability of Kalisaleh Village health volunteers in managing out-of-hospital cardiac arrest cases.

INTRODUCTION

Cardiac arrest is an event that is included in the emergency department where cardiac arrest cases are still the focus of world health problems because the incidence rate is still high, globally in 2014 it was 50 to 60 per 100,000 people / year (AHA, 2020). In Indonesia itself, the prevalence of cardiac

arrest has not been well recorded, but in 2023 it was reported that deaths due to cardiac arrest were >5% (PERKI, 2023). In the case of cardiac arrest, first aid measures can be carried out with basic life support in the form of Hands Only CPR. Hands Only CPR is an attempt to help by compressing the patient's chest and calling for help from the medical team or the nearest health care center (AHA, 2020). Hands Only CPR can be performed by anyone when individuals find cases of cardiac arrest around them. The number of cases of out of hospital cardiac arrest (OHCA) deaths results from delays in providing medical assistance due to the absence of available medical personnel. The lack of skills of ordinary people supported by knowledge about first aid in cases of cardiac arrest is also a contributing factor to deaths due to cardiac arrest (Kementerian Kesehatan RI, 2022). This is also influenced by the lack of knowledge of ordinary people about the CPR action Cardiopulmonary Resucitation (CPR) hands only is a basic aid as an act of life-saving efforts for individuals who experience sudden cardiac arrest.

Hands only CPR can improve the quality of life of individuals after cardiac arrest. The success of Hands Only CPR depends on several factors, the quality of the compression given is an important determinant of the success of the Hands Only CPR process (Guruh Wirasakti, 2020). According to (Al Afik, 2016) the quality of compression given can be influenced by several factors including hand placement, body mass index, physical fatigue, gender. This initiated an effort to improve the skills and knowledge of ordinary people in first aid in cases of out of hospital cardiac arrest (OHCA) which is oriented towards providing good and appropriate Hands Only CPR can be done through health education education is one way that can be done by relevant stake holders (Ana Dwi & Kusyani Asri, 2023).

The rapid development of information technology has created many breakthroughs in providing health education that reaches the community. One of the methods born from the development of information technology is self-directed video. Self-Directed Video can be used as an effective method in providing education about Hands Only CPR for ordinary people. In providing simulations, people/individuals who are given CPR Hands Only video playback are more likely to perform CPR Hands Only actions compared to someone who is not given CPR Hands Only simulation video playback significantly (Bobrow et al., 2011).

The results of interviews conducted by researchers with the village head, village midwife and head of the Kalisaleh village health cadres found that the skills and knowledge of village health cadres about Hands Only CPR are still lacking, which is obtained in direct observation that the provision of Hands Only CPR is only done as long as pressing and hand positioning, with the existence of these problems training for Hands Only CPR actions with Self-Directed learning video media using SIKOMJARU (heart lung compression education phantom) can be an alternative in improving skills supported by knowledge of Hands Only CPR actions in cardiac arrest events outside the hospital. Another study showed that basic life support training on Hands Only CPR through educational phantoms can improve skills and knowledge about Hands Only CPR (Sholehah et al., 2022). The SIKOMJARU phantom is equipped with a blue LED light that indicates compression o a good depth and a red LED that indicates compression at a depth that exceeds the limit, and the addition of a metronome rhythm to guide the administration of compressions with a regular rhythm and the Hands Only CPR SOP according to the American Heart Association (AHA). With various conveniences through the components that have been described, it is hoped that SIKOMJARU can become an educational media to answer existing phenomena.

METHOD

This study is a quantitative study in the form of Quasy Experiment, with a one group design and assessment using direct observation of Hands Only CPR actions demonstrated by health cadres to determine the effect of educational videos on Hands Only CPR actions using SIKOMJARU on the quality of compression of health cadres. The population in this study were all health cadres of Kalisalaeh Village, Belik District, Pemalang Regency.Tenik sampling in this study using Total Sampling where all 40 health cadres of Kalisaleh Village were sampled. Then the 40 people were given the same intervention, namely screening Self-directed learning video CPR Hands Only using SIKOMJARU.

The data collection process was carried out in the 2nd week of October 2024 with the process starting from the village health cadres simulating Hands Only CPR that they understood using the SIKOMJARU phantom, then the researcher observed using the SOP sheet sourced from the AHA (American Heart Association) as a whole. Then playback of the Self-directed learning CPR Hands Only video using SIKOMJARU was carried out as a given intervention. After playing the Self-directed learning CPR Hands Only video using SIKOMJARU, the health cadres conducted a simulation and the researcher made a second observation after the intervention was given.

From the results of Pre-Observation and Post-Observation, categorization is carried out from 10 SOP points with categorization divided into 3, namely good, sufficient and less. The tool used in the simulation to observe the quality of compression performed, namely SIKOMJARU, has gained eligibility through feasibility tests conducted on academics in the field of emergency nursing and expert nurses in the field of emergency care. In data analysis, this study used the Wilcoxon test. This research has also received a letter of ethical testing from the Ethics Committee of the Faculty of Nursing, Muhammadiyah Purwokerto University on September 7, 2024 with the number KEPK/UMP/36/IX/2..

RESULTS

At the beginning of the meeting, researchers observed all health cadres on Hands Only CPR actions given to a SIKOMJARU educational phantom, to determine the quality of Hands Only CPR compressions they performed. Respondents were given one opportunity to perform Hands Only CPR before they were given a screening of the Self-directed learning CPR Hands Only video using SIKOMJARU.

After observing all health cadres, the researchers played the Self-directed learning video CPR Hands Only using SIKOMJARU as an intervention process to the respondents. The video was played twice and it was hoped that all respondents could understand and observe what the video meant.

The next step was to observe Hands Only CPR on all health cadres. Each health cadre is given 1 attempt to perform Hands Only CPR with the compression quality indicator located on a blue light indicating good compression quality and a red light indicating poor compression quality according to depth. The test results of the difference in compression quality values before and after being given a self-directed learning intervention CPR Hands Only video using SIKOMJARU can be seen in the following table.

Table 1. Characteristics of Respondents Based on Gender, Age, Length of experience as a health cadre and Education level of health cadres

Characteristic	F (%)
Gender	
Male	13 (32,5)
Female	27 (67,5)
Age	
21-30	16 (40.0)
31-40	24 (60.0)
Length of experience as a health cadre	
>3tahun	20 (50.0)
<3tahun	20 (50.0)
Education level of health cadres	
Elementary School	7 (17,5)
Junior High School	18 (45.0)
Senior High School	15 (37,5)
Total	40 (100)

The table above shows that there are 40 respondents obtained from the total health cadres in the Kalisaleh village, and the majority of the respondents are female. The age of most respondents is in the age range of 31-40 years. The results shown in the characteristics of the length of experience being a health cadres get balanced results between > 3 years and < 3 years. And at the education level 45 percent of health cadres have a junior high school education.

Table 2. Analysis of Differences in Compression Quality Pre-Observation and Post-Observation with n=40 given the same intervention

	postobservasi - preobservasi
Z	-5.734[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Based on the table of statistical analysis test results using the Wilcoxon Test on all samples given. Intervention Self-Directed Learning Video CPR Hands Only using SIKOMJARU, there is a difference in the quality of compression of health cadres with post-observation results better than pre-observation shown with P velue = 0.000. so that with these results means Self-Directed Learning Video CPR Hands Only using SIKOMJARU has an effect on the quality of compression of village health cadres.

DISCUSSION

Based on the results of the study, it is known that there is an effect of Self-directed learning video CPR Hands Only using SIKOMJARU on improving the quality of compression on village health cadres with (p = 0.000) as a result obtained through the Post-Observation value when given the intervention of playing Self-directed learning video CPR Hands Only using SIKOMJARU with Pre-Observation conducted by the entire sample. With these results making H1 accepted where Self-directed learning video CPR Hands Only using SIKOMJARU which is an educational method about CPR Hands Only.

This research is supported by the characteristics of respondents who show that the majority of respondents are female, this is in line with the data contained in the Kalisaleh Village government that the majority of health cadres are female. The age of most respondents is in the age range of 31-40 years, this is in line with the factors that affect the quality of compression given in Hands Only CPR actions. The results shown in the characteristics of length of service get balanced results between > 3 years and < 3 years, in the characteristics of the education level of health cadres the majority are at the junior high school level, this is in accordance with previous research where it was found that age, gender, length of experience were factors that influenced the quality of Hands Only CPR compression (Al Afik, 2016). The high prevalence of cardiac arrest is a concern for the government in the health sector. This can be minimized by improving the skills and knowledge of ordinary people about first aid in cardiac arrest. Providing life support with

Hands Only CPR can be an effort to provide help and prevent deaths due to cardiac arrest that occurs outside the hospital. This is in line with previous research where Hands Only CPR can provide life expectancy by medical assistance finally arrive (Franciscan Health, 2023)

Improving the skills and knowledge of ordinary people on basic life support Hands Only CPR can be done with education and simulation. Providing education through simulation videos is found to increase knowledge and skills in lay people towards Hands Only CPR. This is in line with existing research that shows significant results in the controlled group regarding skills and knowledge about CPR Hands Only (Wenny Rasmawati Simamora et al., 2023). In this study, it was found that there was an increase in the quality of compression on the number of compressions given, namely 100x/minute, which can be seen using the metronome in the SIKOMJARU phantom, where health cadres who have received the intervention can follow the strains of the metronome as a benchmark for the amount of compression given, this is inversely proportional to research using the Baby Shark song as a guide in giving the amount of compression where there is no effect of the Baby Shark song beat as a guiding metronome for giving the number of Hands Only CPR compressions (Fitriana et al., 2023). These results can occur because the tempo of a song can change according to the lyrics and emotions in the song.

Health cadres are an important component in the community in improving welfare in the health sector. The role of health cadres includes being a coordinator, as a community mobilization team, and providing basic assistance to the community in an emergency (Setyoadi et al., 2015). The education provided also has an impact on how health cadres can become officers who have skills that can provide help and education to ordinary people about cardiac arrest first aid around them. The statement is also supported by research which found that the provision of education that can be done by socialization and direct simulation has an effect on the improvement and skills of health cadres in providing health education and providing first aid for the community. Village health cadres have various references to help the community improve their health welfare because health cadres are the closest component in the health sector in the community (Kismanto et al., 2023).

The rapid development of information technology and telecommunications can help educate the public and health cadres about first aid performed in cases of cardiac arrest around them by emphasizing the quality of compression on indicators of depth and amount of compression where it is found that the accuracy of the depth of health cadres in providing compression has increased with the blue LED light indicator on indicating that the depth of compression has reached the right point. This is in line with research that developed a cardiopulmonary resuscitation educational phantom tool called PREJARU which obtained a result of the effect of basic life training through a PREJARU phantom media on increasing knowledge and basic life support skills in lay people (Putri et al., 2019). In this study, it was found that self-directed learning of CPR Hands Only videos using SIKOMJARU can improve the quality of compressions performed by health cadres. Improving the quality of compression is very useful where the success of Hands Only CPR lies in the quality of compression given to cardiac arrest patients, especially to health cadres as the frontline and closest to the community. The intervention in this study is also in line with previous research where the use of educational videos has a positive impact on increasing knowledge and skills in performing basic life support (CPR Hands Only) (Ningsih and Atmaja, 2019). Likewise, in a previous study that obtained a significant increase in skills and knowledge in health volunteers who received an educational intervention Self-directed learning videos and simulations about providing basic life rocks (Wahyuningsih et al., 2022). The

implementation of video learning also has the advantage that during its execution, the freedom of the learning process possessed by the respondents. (Barlia & Putro, 2022)

This study has limitations where the components of the factors determining the quality of compression are only in the indicators of gender and hand placement on compression. There are still 2 factors that this research cannot explain. With this, it is hoped that future researchers can take into account 2 factors, namely helper fatigue and body mass indexes as determinants of compression quality.

CONCLUSIONS AND RECOMMENDATION

The results of this study indicate the effect of Self-directed learning video CPR Hands Only using SIKOMJARU is very effective in improving the quality of Hands Only CPR compression performed by health cadres in cardiac arrest events. This is evidenced by the difference in observation values before being given the intervention of playing Self-directed learning video CPR Hands Only using SIKOMJARU and after being given the intervention with (P = 0.000). Compression quality is also obtained through a blue LED light which is an indicator of good compression quality in each given compression. This study has limitations where the components of the factors determining the quality of compression are only in the indicators of gender and hand placement in the administration of compression. There are still 2 factors that in this research cannot be explained. With this, it is hoped that future researchers can take into account 2 factors, namely helper fatigue and body mass indexes as determinants of compression quality.

REFERENCES

AHA. (2020). Highlights of the 2020 American Heart Association Guidelines For CPR and ECC. *American Journal of Heart Association*, *9*, 32.

Al Afik, R. F. (2016). Kualitas CPR pada Perawat yang Mengikuti Pelatihan Basic Cardiac Life Support. *Issn 2252 - 5637*, *2 No. 3*(April), 158–229.

Ana Dwi, & Kusyani Asri. (2023). Pengetahuan Bantuan Hidup Dasar dengan Tingkat Kecemasan Keluarga pada Pasien Henti Jantung. *Journal of Education Research*, *4*(1), 100–106.

Barlia, G., & Putro, W. (2022). *Pemanfaatan Media Pembelajaran Video Dalam Pembelajaran Materi Tepid Sponge 1 Poltekes Kemenkes Pontianak , Singkawang , Indonesia 2 Poltekes Kemenkes Pontianak , Singkawang , Indonesia Article Information Received : May , 2022 Revised : June , 2022 Avail*. *4*(2), 390–397.

Bobrow, B. J., Vadeboncoeur, T. F., Spaite, D. W., Potts, J., Denninghoff, K., Chikani, V., Brazil, P. R., Ramsey, B., & Abella, B. S. (2011). The effectiveness of ultrabrief and brief educational videos for training lay responders in hands-only cardiopulmonary resuscitation implications for the future of citizen cardiopulmonary resuscitation training. *Circulation: Cardiovascular Quality and Outcomes*, *4*(2), 220–226. https://doi.org/10.1161/CIRCOUTCOMES.110.959353

Fitriana, N. F., Nitiprodjo, A. H., Juwita, D. R., Amelia, V. L., & Andodo, C. (2023). Pengaruh Pemberian Metronome Video dan Lagu Baby Shark dengan Kecepatan Kompresi Resusitasi Jantung Paru. *Jurnal Keperawatan*, *16*, 587–594.

Franciscan Health. (2023). *How To Do Hands-Only CPR Right*.

Guruh Wirasakti, G. W. (2020). Pengaruh Metode Pembelajaran Multimedia Cardiopulmonary Resuscitation (CPR) Terhadap High Quality CPR. *Jurnal Kesehatan Dr. Soebandi*, *8*(2), 142–147. https://doi.org/10.36858/jkds.v8i2.231

Kementerian Kesehatan RI. (2022). Pentingnya Penanganan Segera pada Henti Jantung. *Direktorat Jenderal*

Pelayanan Kesehatan, 1–5. https://yankes.kemkes.go.id/view_artikel/1008/pentingnya-penanganan-segera-pada-henti-jantung

Kismanto, J., Kusumawardhani, O. B., & Pujilestari, A. (2023). Peningkatan Pengetahuan dan Kepatuhan Kader dalam Pemberian Edukasi Kesehatan di Surakarta. *I-Com: Indonesian Community Journal*, *3*(3), 1338–1345. https://doi.org/10.33379/icom.v3i3.3148

PERKI, 2023. (2023). Pedomam Tatalaksana penyakit gagal jantung. In *NBER Working Papers*. http://www.nber.org/papers/w16019

Putri, R. P., Safitri, F. N., Munir, S., & Endiyono, A. H. (2019). Pelatihan Bantuan Hidup Dasar Dengan Media Phantom Resusitasi Jantung Paru (Prejaru) Meningkatkan Pengetahuan dan Keterampilan Bantuan Hidup Dasar pada Orang Awam. *Jurnal Gawat Darurat*, *1*(1), 7–12.

Setyoadi, Ahsan, & Abidin, A. Y. (2015). Hubungan Peran Kader Kesehatan Dengan Tingkat Kualitas Hidup Lanjut Usia. *The Effects of Brief Mindfulness Intervention on Acute Pain Experience: An Examination of Individual Difference*, *1*(2), 1689–1699.

Sholehah, B., Ningsih, N. K., & Umiyati, U. (2022). Hubungan Simulasi Resusitasi Jantung Paru (Hand Only CPR) dengan Tingkat Pengetahuan dan Keterampilan Bantuan Hidup Dasar (BHD) pada Siswa Madrasah Aliyah Zainul Hasan 4 Pakuniran Probolinggo. *TRILOGI: Jurnal Ilmu Teknologi, Kesehatan, Dan Humaniora*, *3*(3), 151–157. https://doi.org/10.33650/trilogi.v3i3.4707

Wahyuningsih, I., Rifa'i, V. A., Herlianita, R., & Pratiwi, I. D. (2022). Pengaruh Metode Self Direct Video Dan Simulasi Terhadap Pengetahuan Dan Keterampilan Resusitasi Jantung Paru (RJP) Pada Relawan. *Jurnal Multidisiplin Madani*, *2*(1), 155–170. https://doi.org/10.54259/mudima.v2i1.345

Wenny Rasmawati Simamora, Supriyadi Supriyadi, Erianto Fanani, & Marji Marji. (2023). Pengaruh Video Dan Simulasi RJP Terhadap Tingkat Pengetahuan Dan Sikap Atlet Sepatu Roda Kota Malang. *Jurnal Medika Nusantara*, *1*(4), 172–193. https://doi.org/10.59680/medika.v1i4.618