ISSN 2797-8400 (Print) | ISSN 2797-8419 (Online)
https://e-jurnal.iphorr.com/index.php/msc
DOI: 10.56922

Submitted: 5 August 2026 Revised: 20 September 2026 Published: 30 September 2026

Knowledge and self-efficacy of lay rescuers following video education on basic life support

Muhammad Ardjuna Shri Abdee Negara*, Sutrisno, Fajar Alam Putra

Program studi Keperawatan Universitas Sahid Surakarta
Corresponding Author: Sutrisno. Email: roshansutrisno@gmail.com

Abstract

Background: Limited knowledge and self-efficacy may hinder lay rescuers from providing basic life support (BLS). Educational videos offer a practical way to demonstrate BLS procedures in a community setting.
Purpose: To examine immediate changes in BLS knowledge and self-efficacy among members of the REMAPI Gondangrejo youth organization following video education.
Method: This pre-experimental one-group pretest-posttest study included all 40 members of the accessible population through total sampling. Participants watched a 7-minute 14-second BLS educational video once and completed the posttest five minutes later. Knowledge was assessed using a 15-item questionnaire and self-efficacy using an 8-item questionnaire. Knowledge scores were analyzed using a paired-samples t-test, while pretest-posttest self-efficacy was analyzed using a marginal homogeneity test.
Results: Good knowledge was reported by 1 participant (2.5%) at pretest and increased to 26 participants (65.0%) at posttest. High self-efficacy increased from 1 participant (2.5%) at pretest to 24 participants (60.0%) at posttest. Mean knowledge scores increased from 40.10 ± 21.46 to 81.48 ± 11.82. Knowledge and self-efficacy both showed significant pretest-posttest changes (p = 0.001).
Conclusion: BLS video education was followed by higher immediate knowledge scores and self-efficacy. Because the study had no control group and used an immediate posttest, the findings do not establish a causal effect, sustained retention, or practical BLS competence.

Keywords: Basic Life Support; Educational Video; Knowledge; Lay Rescuers; Self-Efficacy.

INTRODUCTION

Cardiac arrest is a medical emergency in which early recognition and prompt basic life support (BLS) are critical. Community members may be the first people present and therefore need sufficient knowledge and confidence to begin assistance before healthcare professionals arrive (American Heart Association, 2025). Preparing lay rescuers is therefore an important component of community emergency response.

Knowledge alone may not be sufficient for action. Self-efficacy refers to a person's belief in their ability to perform a specific behavior and may influence willingness to initiate a difficult task. In BLS, individuals who understand the procedure but lack confidence may still hesitate to act during an emergency.

Video education combines narration, visual explanation, and procedural demonstration and can be replayed when needed. Evidence from randomized and quasi-experimental studies shows that video-assisted, blended, and other technology-supported BLS/CPR education can improve knowledge, practical performance, or confidence, although video is not consistently superior to instructor-led or simulation-based approaches (Chang, Wu, Yang, Lin, Huang, Yu, & Hu, 2023; George, Hampton, & Elliott, 2023; Kardaş Özdemir, Kesgin Güngör, & Cici, 2023; Ko, Lin, Chiang, Yang, Hsieh, & Ma, 2024; Marcus, Abdullah, Nor, Tuan Kamauzaman, & Pang, 2022).

Training design also influences confidence and retention. Studies of schoolchildren, medical students, and nursing students have reported that BLS education can improve self-efficacy or confidence, while reviews emphasize the importance of repeated practice, objective feedback, and retention assessment rather than relying only on immediate post-training scores (Dick-Smith, Power,

DOI: https://doi.org/10.56922/msc.v6i5.4328

Martinez-Maldonado, & Elliott, 2021; Süss-Havemann, Kosan, Seibold, Dibbern, Daubmann, Kubitz, & Beck, 2020; Thommes, Schmidt, Lambert, Schauwinhold, Klasen, & Sopka, 2023; Tucker, Urwin, Tomietto, & Unsworth, 2023).

Preliminary interviews on 6 December 2025 with five members of Karang Taruna REMAPI Gondangrejo indicated limited prior BLS education and low confidence in performing cardiopulmonary resuscitation. Participants reported fear of making mistakes and uncertainty about the correct procedure. A locally reported suspected cardiac-arrest event in 2023 was also described as receiving no immediate BLS before referral. This study therefore examined immediate changes in knowledge and self-efficacy after BLS video education among members of Karang Taruna REMAPI Gondangrejo.

RESEARCH METHOD

This quantitative study used a pre-experimental one-group pretest-posttest design without a control group. It was conducted on 21 May 2026 at Karang Taruna REMAPI, Dukuh Pilangrejo, Kelurahan Krendowahono, Kecamatan Gondangrejo, Kabupaten Karanganyar. All 40 members of the accessible population were included through total sampling.

Participants completed a pretest using Google Forms, watched a BLS educational video lasting 7 minutes 14 seconds once, and completed the posttest five minutes later. The video combined narration, text, illustrative images, and practical demonstrations using a resuscitation manikin.

BLS knowledge was assessed using a 15-item multiple-choice questionnaire adapted from Alif (2025). Correct answers were scored 1 and incorrect answers 0, with scores converted to a 0–100 scale. Knowledge was categorized as good (76–100), moderate (65–75), or poor (<65). Reported item-validity coefficients ranged from 0.485 to 0.751 and Cronbach's alpha was 0.902.

Self-efficacy was assessed using an 8-item questionnaire adapted from Lestari (2023), scored on a four-point Likert scale. Total scores ranged from 8 to 32 and were categorized as low (<24) or high (≥24). Item-validity coefficients reportedly ranged from 0.741 to 0.899, and Cronbach's alpha was 0.929.

The educational video was reviewed by one subject-matter expert and one media expert using a content validity index (CVI). Both expert assessments reportedly produced a CVI of 1.00.

Participant characteristics and categorical outcomes were summarized using frequencies and percentages. Knowledge scores were summarized using mean ± standard deviation. The Shapiro-Wilk test was used to assess knowledge-score normality. Pretest and posttest knowledge scores were compared using a paired-samples t-test, while pretest-posttest self-efficacy was analyzed using a marginal homogeneity test. Statistical significance was set at $p < 0.05$.

RESEARCH RESULTS

Table 1. Participant characteristics (N = 40)

Variable	Results
Gender	
Male	16/40.0
Female	24/60.0
Age (Years)	
12–16	1/2.5
17-25	36/90.0
26-35	3/7.5
Education Level	
Junior high school	2/5.0
Senior high school	23/57.5
Diploma	3/7.5
Higher education	12/30.0

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Occupation	
Student	8/20.0
Private-sector employee	23/57.5
Self-employed	6/15.0
Not employed	3/7.5
Source of BLS information	
Teacher	1/2.5
Healthcare worker	15/37.5
Television	1/2.5
Internet	23/57.5

Table 1 shows that most participants were female (60.0%) and aged 17–25 years (90.0%). Senior high school was the most common educational level (57.5%), private-sector employment was the most frequent employment status (57.5%), and the internet was the most frequently reported source of BLS information (57.5%).

Table 2. Knowledge and self-efficacy before and after video education (N = 40)

Outcome category	Pretest	Posttest
Knowledge		
Poor (<65)	33/82.5	3/7.5
Moderate (65–75)	6/15.0	11/27.5
Good (76–100)	1/2.5	26/65.0
Self-efficacy		
Low (<24)	39/97.5	16/40.0
High (≥24)	1/2.5	24/60.0

Table 2 shows an improvement in both knowledge and self-efficacy following video-based education. The proportion of participants with good knowledge increased from 2.5% at pretest to 65.0% at posttest, while high self-efficacy increased from 2.5% to 60.0%. The change in self-efficacy was statistically significant (p = 0.001).

Table 3. Knowledge scores before and after video education (N = 40)

Measurement	N	Mean ± SD	Mean increase	Reported p value
Pretest	40	40.10 ± 21.46	41.38	0.001
Posttest	40	81.48 ± 11.82		

Table 3 shows that the mean knowledge score increased from 40.10 ± 21.46 before the intervention to 81.48 ± 11.82 after the intervention. The mean increase was 41.38 ± 9.64 points, and the difference was statistically significant (p = 0.001).

DISCUSSION

Knowledge scores and self-efficacy were higher immediately after participants watched the BLS educational video. The mean knowledge increase of 41.38 points was accompanied by a shift from predominantly poor knowledge at pretest to predominantly good knowledge at posttest. These changes occurred over a very short interval in a single group, so they should be interpreted as immediate pretest-posttest changes rather than as evidence that the video alone caused the improvement.

The knowledge finding is broadly consistent with previous studies reporting improved BLS knowledge after educational interventions, including video-based and self-directed learning. Randomized studies in laypersons and students have shown that self-instruction, blended learning, and video-supported training can produce meaningful learning gains, although performance varies by training design and outcome measured (Goldberg, Cash,

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Peters, Jiang, O'Brien, Hasdianda, Eberl, Salerno, Lees, Kaithamattam, Tom, Panchal, & Goralnick, 2024; Ko, Yang, Lin, Chiang, Hsieh, & Ma, 2021; Telli, Camgöz, Yaman, & Arslan, 2026). Indonesian studies have likewise reported short-term improvements in BLS knowledge or skills following video-based or other educational approaches (Hidayat, Hatmalyakin, & Alfikrie, 2023; Ningsih & Atmaja, 2019; Praditya, Prakoso, Firdaus, & Witriyani, 2025). Video can present procedural steps sequentially and combine visual demonstration with verbal explanation; however, the present study did not measure which elements of the video contributed to learning.

High self-efficacy increased from 2.5% to 60.0%. Similar educational approaches have been associated with improved confidence or self-efficacy among learners receiving resuscitation training (Cahyo, Roulita, & Meilando, 2023; Süss-Havemann et al., 2020; Thommes et al., 2023; Tucker et al., 2023; Zulhan, 2024). Observing a demonstrated procedure may help participants feel more prepared to attempt BLS, but self-reported confidence should not be interpreted as evidence of correct CPR performance.

Most participants were aged 17–25 years and the internet was their most frequent source of BLS information. These are descriptive characteristics only. The study did not test whether age, education, occupation, or information source modified the observed pretest-posttest changes.

Several limitations should be considered. The study included only 40 participants from one youth organization and had no control group. The posttest was administered five minutes after a single video, so the design cannot distinguish intervention effects from repeated-testing effects, short-term recall, or other influences. Retention was not assessed. Self-efficacy was self-reported, practical BLS skills were not observed, and prior exposure to BLS information was not controlled. These limitations restrict causal interpretation and generalizability.

CONCLUSION

Higher immediate knowledge scores and self-efficacy among members of Karang Taruna REMAPI Gondangrejo were observed after the BLS video education. Both pretest-posttest analyses were reported as statistically significant. Because the study used a one-group design and an immediate posttest, the findings do not establish a causal effect of the video, long-term retention, or practical BLS competence.

SUGGESTION

Youth organization members should receive periodic BLS education that combines video material with supervised hands-on practice. Future studies should include a control group, larger samples, delayed follow-up, and objective assessment of practical BLS skills. Reporting the full paired t-test output and retaining the marginal-homogeneity output would also strengthen statistical transparency.

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