

Evaluating Skills, Self-Efficacy, and Willingness for CPR in Rural Junior High Students: A Comparison of HEART Film and BEAT Module

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Submitted : 13th August 2025 ; Accepted : 16 October 2025

Doi : <https://doi.org/10.36858/jkds.v13i2.1008>

ABSTRACT

The high incidence of cardiac arrest, coupled with the low number of bystanders performing CPR as the first responders in out-of-hospital cases, continues to draw attention worldwide. The HEART film and BEAT module present viable media solutions in efforts to provide CPR training to various community groups. The purpose is to analyze the differences between the HEART film and the BEAT module in relation to skills, self-efficacy and willingness of school-age students in conducting CPR in rural areas. This study utilized a quasi-experimental method with a two-group pretest-posttest design, conducted on 144 samples divided into two groups: the HEART film (Helping Emergency Actions Resuscitate Today) group and the BEAT module (Bringing Emergency Actions to Thrive) group. Simple random sampling was used to select participants from SMPN 1 Kalisat. In the pretest phase, no significant differences were found in skills, self-efficacy, and willingness between the HEART and BEAT groups ($p > 0,05$). However, after training and one week post-training, significant differences were observed in these factors ($p < 0,05$). The HEART film-based CPR learning media has proven to be more effective than the BEAT module in enhancing students' skills, self-efficacy, and willingness. However, both learning media can be considered suitable and effective for CPR education among students in rural areas..

Keyword: CPR, Skill, Self Efficacy, Willingness

ABSTRAK

Tingginya angka kejadian henti jantung, yang disertai dengan rendahnya jumlah orang yang melakukan CPR sebagai penolong pertama kasus di luar rumah sakit, terus menjadi perhatian di seluruh dunia. Film HEART dan modul BEAT menawarkan solusi media yang efektif dalam upaya memberikan pelatihan CPR kepada berbagai kelompok masyarakat. Penelitian ini bertujuan untuk menganalisis perbedaan antara film HEART dan modul BEAT terkait dengan keterampilan, efikasi diri dan kesediaan siswa usia sekolah di daerah rural dalam melakukan CPR. Penggunaan metode yaitu kuasi eksperimen dengan desain dua kelompok pretest-posttest, yang dilakukan pada 144 sampel dari SMPN 1 Kalisat menggunakan dua kelompok dengan teknik simple random sampling: kelompok film HEART (Helping Emergency Actions Resuscitate Today) dan kelompok modul BEAT (Bringing Emergency Actions to Thrive). Pada fase pretest, tidak ditemukan perbedaan signifikan dalam keterampilan, efikasi diri, dan kesediaan antara kelompok HEART dan BEAT ($p > 0,05$). Namun, setelah pelatihan dan satu minggu pasca pelatihan, ditemukan perbedaan signifikan dalam faktor-faktor tersebut ($p < 0,05$). Media pembelajaran CPR berbasis film HEART terbukti lebih efektif dibandingkan dengan modul BEAT dalam meningkatkan keterampilan, efikasi diri, dan kesediaan siswa. Meskipun demikian, kedua media pembelajaran tersebut dapat sesuai dan efektif digunakan dalam pembelajaran CPR pada siswa sekolah di daerah rural.

Kata Kunci: CPR, Efikasi Diri, Kesediaan, Keterampilan

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How to Cite : Wahyu Wulansari, Y., Wirasakti, G., Darotin, R., Madyaning Nastiti, E., & Ekaprasetia, F. Evaluating Skills, Self-Efficacy, and Willingness for CPR in Rural Junior High Students: A Comparison of HEART Film and BEAT Module. *Jurnal Kesehatan Dr. Soebandi*, 13(2).
<https://doi.org/10.36858/jkds.v13i2.1008>

Introduction:

Out-of-hospital cardiac arrest (OHCA) remains one of the leading preventable causes of death globally. According to data from the American Heart Association (AHA), more than 70% of cardiac arrest cases occur outside of hospital settings, often in public places or at home, where access to prompt medical assistance is highly limited. In many countries, the mortality rate from OHCA remains high due to the lack of rapid and appropriate resuscitation prior to the arrival of emergency medical services, with an incidence of 110,8 per 100,000 population across all age groups (Benjamin et al., 2019). The speed of intervention by bystander, or first responders, significantly influences the success of resuscitation and the survival rate of OHCA victims. Every second of delay can result in brain and vital organ damage due to oxygen deprivation. Therefore, quick response is critical to improving the chances of survival for victims (Yun, 2025). In Japan, it has been reported that 65% of all OHCA cases occur at home (Kiyohara, 2019). Ordinary people, as the first to encounter OHCA victims, may misinterpret the symptoms of cardiac arrest and often contact family or close friends first, before calling emergency medical services (EMS) (Myal, 2020). This delay in contacting medical services can hinder the timely medical response required. The first intervention, such as performing CPR or using an AED, determines whether the victim can survive. Research indicates that every any delay of one minute in performing CPR reduces the victim's chance of living by 10% (Li et al., 2024).

One of the factors contributing to the low rate of first aid interventions is the lack of public knowledge, especially in rural areas, about how to conduct CPR, as well as the low levels of self-efficacy and willingness to react in critical circumstances (Munot et al., 2022). A decrease in self-efficacy and readiness to carry out emergency actions like CPR is often due to limited understanding and practical skills within communities, particularly in rural areas. School-aged children represent a group with significant potential to learn emergency skills such as CPR, as they are physically and cognitively enough at this stage to understand and apply basic CPR

procedures. Furthermore, early CPR education can help cultivate a broader culture of first aid within the community, given that they are often witnesses or the first individuals to provide assistance during emergency situations (Wulansari et al., 2025). Therefore, effective CPR education and training are essential to enhancing the community's preparedness to administer first aid (Ko, 2023). In response to these challenges, various CPR training approaches have been introduced, one of which involves the use of educational media such as films and modules. These media were selected because of their ability to reach a broader audience in an engaging and easily understandable way. Educational films can convey information visually and dynamically, helping the audience understand CPR procedures through practical examples and emergency situation simulations (Nabavian, 2025). On the other hand, text- and image-based training modules can provide more detailed explanations that individuals can learn at their own pace (Wider, 2024).

The use of media such as films and modules offers several advantages, including ease of distribution, lower costs, and flexibility in training times. Educational films can be watched anytime and anywhere, allowing individuals to learn independently (Abuejheisheh, 2023). Training modules, with a more interactive approach, enable participants to learn theory while simultaneously practicing CPR steps (Lin, 2022). Therefore, the selection of the HEART film (Helping Emergency Actions Resuscitate Today) and the BEAT module (Bringing Emergency Actions to Thrive) is an ideal choice for educating the public to deliver appropriate initial care for OHCA cases, particularly in rural areas.

Methods:

The research design employed in this study was a quasi-experimental design with a two-group pretest-posttest, involving the HEART film group and the BEAT module group. The study was conducted at SMPN 1 Kalisat Jember, with a total of 144 participants using a simple random sampling who met the inclusion criteria: (1) immersed in educational activities, (2) who had not previously received CPR training, and (3) who consented to participate as respondents. The

exclusion criterion was the occurrence of illness among participants during the intervention period. The instructional method applied in this study consisted of an explanation of CPR material delivered by an instructor using simulation techniques, with the support of media tools such as the HEART film (Helping Emergency Actions Resuscitate Today) and the BEAT module (Bringing Emergency Actions to Thrive), both developed by the research team based on the AHA guidelines. Both methods are given three times a day. These media materials provided detailed instructions on recognizing a cardiac arrest victim and performing immediate first aid, which included calling an ambulance and administering CPR. Both media used local "Pandalungan" dialect with accompanying Indonesian subtitles to ensure clarity and cultural relevance for the target audience. Data were collected at three points: before training, immediately after training, and one week post-training for each group. The data collection tools included the CPR action observation sheet based on the AHA guidelines, self-efficacy questionnaire referring to the General Self-Efficacy scale by Schwarzer and Jerusalem (1995) with item validity results $> 0,397$ and a Cronbach's Alpha value of $0,810$, and willingness to deliver CPR questionnaire based on the research by Chew (2009), where the item validity results > 0.361 and the Cronbach's Alpha value was 0.837 . Pretest, posttest 1, and posttest 2 data concerning skills, self-efficacy, and willingness were analyzed using the Friedman test as a result of the data's skewed distribution, with a confidence interval of 95%. Furthermore, the test used to determine the difference in training impact within the two research groups was the Mann-Whitney test. Ethical approval was granted by the Ethical Committee of Medical Research Faculty of Dentistry University of Jember No. 2037/UN25.8/KEPK/DL/2023

Results:

Table 1. Research Respondent Demographics

Characteristics	Category	Frequency	%
Age	12 yo	55	38
	13 yo	76	53
	14 yo	13	9

Characteristics	Category	Frequency	%
	Total	144	100
Gender	Male	77	53
	Female	67	47
	Total	144	100

Based on the table above, most of the respondents are 13 years old (53%) and male (53%).

Table 2. The skills, self-efficacy, and willingness of students to conduct CPR within the HEART film group.

Variable	Category	Mean	Min	Max	p
Skills	Pretest	0	0	0	0,000
	Posttest 1	5,33	4	6	
	Posttest 2	4,45	1	6	
Self-Efficacy	Pretest	14,73	13	27	0,000
	Posttest 1	33,88	24	40	
	Posttest 2	30,27	23	37	
Willingness	Pretest	9,68	8	14	0,000
	Posttest 1	14,13	12	16	
	Posttest 2	13,75	12	16	

Friedman test. Post hoc wilcoxon

In Table 2, the data indicates that all three p-values are $< 0,05$ suggesting significant differences in the skills, self-efficacy, and willingness of students to perform CPR before, immediately after, and one week following the educational intervention using the HEART film. In the pretest phase, prior to the training, respondents were unable to perform CPR, with the overall skill score being 0. The average self-efficacy score was 14,73, and the average willingness score was 9,68 (with 4 to 5 responses indicating willingness). Following the training (posttest 1), the respondents average skill level increased to 5,33 (with 5 to 6 actions performed correctly), the average self-efficacy score rose to 33,88 and the average willingness score increased to 14,13 (with 7 to 8 responses indicating willingness). One week after the training (posttest 2), the respondents average skill level was 4,45 (with 4 to 5 actions performed correctly), the average self-efficacy score was 30,27 and the average willingness score was 13,75 (with 6 to 7 responses indicating willingness).

Table 3. The skills, self-efficacy, and willingness of students to conduct CPR within the BEAT module group.

Variable	Category	Mean	Min	Max	p
Skills	Pretest	0	0	0	0,000
	Posttest 1	4,77	3	6	
	Posttest 2	3,52	2	5	
Self-Efficacy	Pretest	13,58	13	26	0,000
	Posttest 1	30,15	24	37	
	Posttest 2	24,25	23	34	
Willingness	Pretest	10,07	8	15	0,000
	Posttest 1	13,73	12	16	
	Posttest 2	13,07	11	15	

Friedman test. Post hoc wilcoxon

In Table 3, the data indicates that all three p-values are < 0.05 , suggesting significant differences in the skills, self-efficacy, and willingness of students to deliver CPR before, immediately after, and one week following the educational intervention using the BEAT module. The next step in the measurement process involved comparing the two groups across the three variables presented in Table 4 below.

Table 4. The differences in skills, self-efficacy, and willingness of students to conduct CPR between the HEART film group and the BEAT module group.

Variable	Pretest		Posttest 1		Posttest 2	
	Mean	p	Mean	p	Mean	p
Skills	1,000		0,001		0,000	
	HEART	0	5,33		4,45	
BEAT	0		4,77		3,52	
Self-Efficacy	0,052		0,001		0,000	
	HEART	14,73	33,88		30,27	
BEAT	13,58		30,15		24,25	
Willingness	0,084		0,040		0,002	
	HEART	9,68	14,13		13,75	
BEAT	10,07		13,73		13,07	

In the initial phase, prior to the training (pretest), no significant differences were found in the skills, self-efficacy, and willingness of respondents within the HEART and BEAT groups, with a p-value $> 0,05$. However, after the training and one week post-training, significant

differences were observed in the skills, self-efficacy, and willingness scores between the HEART and BEAT groups ($p < 0,05$). Furthermore, as shown in Table 4, the mean scores for skills, self-efficacy, and willingness in the HEART group were higher compared to the BEAT group.

Discussion : Differences in Skills, Self-Efficacy, and Willingness to Conduct CPR Using the HEART Film

The impact of CPR training utilizing the HEART Film method demonstrated a significant difference among pretest, posttest, and one-week post training assessments in terms of skills, self-efficacy, and willingness to perform CPR. This finding is supported by the results of the post hoc Wilcoxon test, which yielded a p-value of 0,000 ($p < 0,05$). Both the posttest 1 and posttest 2 scores exhibited higher averages compared to the pre-test scores, indicating an improvement in participants skills, self-efficacy, and willingness to conduct CPR after undergoing training with HEART film-based learning media.

In CPR training utilizing the simulation method with HEART film media, the video content highlights real events, people, and locations, incorporating the local language of rural communities. The HEART film enhances participants comprehension of the information by depicting scenarios that closely mirror real-life situations commonly encountered in society. The storyline follows a teacher experiencing cardiac arrest, allowing participants to observe the signs and symptoms of cardiac arrest, as well as see students providing appropriate first aid, including performing hands-only CPR. By presenting realistic scenarios, the HEART film facilitates better retention of learned concepts, thereby enhancing the overall learning experience.

Xie et al., (2025) explains that video is a recommended medium in educational settings, particularly in health education, as it helps to foster positive attitudes among students towards the material. Additionally, students' skills can be enhanced through films that feature real characters. This aligns with Lauridsen et al., (2022) research, which used video media in CPR

education and revealed a significant improvement in both understanding and abilities in bystander CPR participants. Moreover, Ecker et al., (2021) emphasizes that using films with easily understandable language aids participants in enhancing their CPR skills.

The importance of CPR skills extends beyond technical proficiency; it is also influenced by psychological factors such as self-efficacy and the willingness to act in emergency situations. The technical skills acquired through training must be supported by increased self-efficacy and readiness, ensuring that participants not only perform CPR correctly but also feel confident and prepared to act in high-pressure situations. Learning media that encourage students to enhance their self-efficacy, such as through the use of engaging images, can foster this readiness (Kassabry, 2023). Similarly, another study found that nursing students who received training through engaging videos were more willing to deliver CPR than those who did not. This evidence aligns with the training conducted by the researcher, where the use of the HEART film-based learning media, featuring an engaging storyline, enhanced self-efficacy and willingness among participants to perform CPR (Yunita Wahyu Wulansari & Wirasakti, 2022).

Jaskiewicz et al., (2022) states that individuals who have undergone CPR education beforehand demonstrate greater self-efficacy, which subsequently influences the willingness of the general public to deliver CPR on OHCA patients. This is substantiated by Gao et al., (2024), who identified prior CPR training as one of the key factors influencing self-efficacy in performing CPR among laypeople. Mao et al., (2021) further highlights that CPR training strengthens the willingness of the society to intervene and conduct CPR.

Differences in Skills, Self-Efficacy, and Willingness to Conduct CPR Using the BEAT Module

The impact of CPR training using module-based learning media demonstrated a significant difference between pretest, posttest, and one-week post-training assessments in terms of skills, self-efficacy, and willingness to conduct CPR. This

finding was supported by the post hoc Wilcoxon test, which yielded a p-value of 0,000 ($p < 0,05$). The posttest 1 and posttest 2 outcomes were substantially greater than the pre-test average, indicating an improvement in the participants skills, self-efficacy, and willingness to conduct CPR after undergoing training with the BEAT module learning media.

CPR training using the simulation method with module-based media is commonly employed in CPR education. In this study, the researcher used certified instructors who employed lecture-based learning followed by simulation exercises. Participants were provided with modules to support the training process. The instructional style of the trainer and the engaging content of the module can influence the effectiveness of the training. This method is often referred to as the traditional training method, which is considered one of the most effective and frequently used approaches to enhancing skills in performing CPR (Wider et al., 2024). This is substantiated by Chien et al., (2024), who established that CPR training using modules effectively improved both the knowledge and skills of participants.

One of the key benefits for the participants was the availability of a module to assist the simulation process, which could be directly referenced during the training. Participants could consult their modules whenever they encountered difficulties. The simulation process with module-based media also facilitated the development of self-efficacy in performing the tasks. Another advantage of module-based learning is that it allows participants to study and practice the technical procedures of CPR in detail, following the guidelines provided in the training modules (Abuejheisheh et al., 2023). This training method provides participants with the opportunity to observe instructor demonstrations of CPR and receive direct guidance, followed by evaluations at the end of each session, which further enhances their skill development (Zenani et al., 2022).

However, one limitation of this training method is that participants may focus more on listening to the instructor and reading the module content, which can make the learning process less engaging, especially for younger students such as those in junior high school. This often leads to

participants quickly forgetting the material, which can result in a decline in their skills over a short period. Abuejheisheh et al., (2023), supports this, noting that while knowledge retention tends to be stable over time, psychomotor skills (such as CPR techniques) tend to deteriorate more rapidly, sometimes even within the first week following training.

CPR training for the society enhances skills in conducting CPR, which in turn increases self-efficacy and willingness to act during emergencies (Jaskiewicz et al., 2022). Mao et al., (2021), conducted a study using the simulation method in CPR training and determined that there was an elevate in the willingness of participants to conduct CPR on cardiac arrest victims. However, participants who did not show an increase in willingness were primarily concerned about the potential for causing further injury during CPR, which contributed to their hesitation in performing the life-saving procedure.

Differences in Skills, Self-Efficacy, and Willingness to Conduct CPR Between the HEART Film and BEAT Module

The statistical test findings confirmed that, leading up to CPR training, there were no major differences in skills, self-efficacy, and willingness within the HEART film group and the BEAT module group. However, significant differences were observed in both groups after training and one-week post-training. The HEART film group demonstrated higher average scores compared to the BEAT module group. While the respondent's skills improved, it cannot be concluded that they are fully competent to act as bystander CPR providers, as the minimum competency required for this role is reflected by achieving the maximum score in this study.

Hasanah et al. (2023), compared the effectiveness of video media and PowerPoint slides in improving CPR abilities among non-healthcare students. The study found that the group using video media had significantly higher skill scores compared to the group using PowerPoint slides. This aligns with the current study, where the simulation method combined with the HEART film provided a more positive impact on participants' skills. Videos

demonstrating skills are more authentic and engaging, motivating students to replicate the actions shown, compared to static media (Bimantoro et al., 2023). A study by Sentana et al. (2018), compared CPR training using video with training using a manual guide for the general public in rural areas. The results showed that video-based training was more effective in improving knowledge, skills, and the willingness of the community to conduct CPR compared to using a manual guide.

In addition to skills, self-efficacy and willingness are critical factors influencing how effectively an individual can perform life-saving actions in an emergency. The researcher found that respondents' self-efficacy in assisting cardiac arrest victims increased after receiving CPR training. This is consistent with Gao et al. (2024), who stated that one of the factors influencing self-efficacy in administering CPR is prior participation in CPR training. Farilya & Utami (2023), demonstrated that the simulation method in Basic Life Support (BLS) training significantly improved both skills and self-efficacy, with a p-value of 0,018, revealing a major impact of the simulation method on these variables. This is further supported by Jaskiewicz et al. (2022), who explained that bystanders who have underwent CPR instruction exhibit higher self-efficacy, which influences the willingness of the general public to deliver CPR on OHCA victims, thereby contributing to a reduction in mortality rates in China. To achieve this, standardized and practical training approaches are needed to develop skilled bystanders who possess both the self-efficacy and willingness to conduct CPR correctly on OHCA victims.

Wulansari et al. (2025), as part of a study with junior high school students, identified that respondents' willingness to conduct CPR was notably higher when aiding relatives (93.1%) and companions (94.4%) compared to strangers. This willingness is influenced by both intrinsic and extrinsic factors. Intrinsic elements consist of an individual's humanitarian values, while extrinsic elements contain the willingness of other bystanders nearby (Grunau et al., 2020).

The reluctance to conduct CPR on strangers is a major element in decreasing

bystander willingness to assist OHCA victims. A study conducted in China identified that gender influences the willingness to conduct CPR on female victims. The findings indicated that women are more willing to provide CPR to other women, while men tend to hesitate due to considerations about physical proximity, particularly concerning the removal of clothing during resuscitation (Cheng et al., 2025). Furthermore, societal norms that discourage physical contact between individuals of different genders can impact the willingness to assist strangers of the opposite sex. This cultural barrier contradicts the fundamental principle of CPR, which requires physical contact with the victim to perform life-saving actions.

Farquharson et al. (2023), identified that fear of making mistakes, harming the victim, and the risk of infection are significant barriers for trained individuals when performing CPR. Despite having the necessary skills, these concerns can prevent action. Self-efficacy is a key factor determining whether an individual is willing to help an OHCA victim. Even if someone knows how to deliver CPR, a lack of self-efficacy can affect their willingness to take action (Tian et al., 2024).

This study has several limitations that should be acknowledged. First, the research sample was confined to students at SMPN 1 Kalisat Jember, which may limit the generalizability of the findings to junior high school students in other regions with differing demographic, social, and cultural characteristics. Second, the assessment of skills, self-efficacy, and willingness was conducted only up to one week following the intervention. This short-term evaluation restricts the understanding of the long-term effects of CPR training using the HEART film and BEAT module, making it uncertain whether the knowledge and skills acquired by the students will be retained over time or influence their behavior in real-life emergency situations.

Conclusions:

The HEART film has been proven to be more effective than the BEAT module in enhancing student's skills, self-efficacy, and willingness. The findings of this study indicate that HEART film has a greater impact on

student's ability to perform CPR and significantly enhances their self-efficacy when facing emergency situations. Additionally, HEART film has been successful in encouraging students to be more willing to take action in life-saving interventions. Nevertheless, both types of learning media, HEART film and BEAT module, can still be considered suitable and effective options for CPR education, particularly among school-age students in rural areas. Both media demonstrate considerable potential in educating students on these essential skills, which are crucial in environments that may face limitations in access to medical facilities and training.

Acknowledgement:

We would like to express our sincere gratitude to Universitas dr. Soebandi, especially the LPPM, for their support and the opportunity provided. We also extend our thanks to the enumerators, the Jember District Education Office, and SMPN 1 Kalisat for their collaboration in this research.

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