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ORIGINAL ARTICLE

The Effect of Documentary Short Films on Enhancing Student's Confidence and Willingness to Perform CPR in Rural Areas

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ABSTRACT

Introduction: *Out-of-hospital cardiac arrest (OHCA) is a critical emergency condition that necessitates immediate intervention to prevent fatal outcomes. In rural areas, where access to quality educational resources is limited, Documentary Short Films (DSF) can provide essential training that enhances individuals' confidence and willingness to act decisively in emergency situations involving OHCA through CPR.* ***Objectives:*** *To analyze the effect of DSF on enhancing student's confidence and willingness to perform CPR in rural areas.* ***Methods:*** *This study employed a quasi-experimental design utilizing a one-group pretest-posttest framework, conducted at a junior high school in Jember Regency, involving 72 students selected through proportionate stratified random sampling. The educational media utilized was a Documentary Short Film (DSF). Following the administration of a pretest questionnaire and the viewing of the DSF, a post-test was administered one week later to assess changes in self-confidence and willingness to perform CPR.* ***Results*** *The results indicate a significant difference in students' confidence and willingness to perform CPR before and after the educational intervention using the DSF ($p < 0.05$). The average self-confidence score among respondents rose from 5.78 (2 – 3 questions responding with 'confidence') to 9.43 (4 – 5 questions responding with 'confidence'). Additionally, the average willingness score showed an improvement from 9.13 (3 – 5 questions responding with 'willing') to 15.68 (7 – 8 questions responding with 'willing').* ***Conclusions:*** *DSF for CPR training effectively enhances rural middle school students' confidence and willingness, improving community emergency response and safety .*

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Introduction

Out-of-hospital cardiac arrest (OHCA) is a serious emergency condition and leading cause of death worldwide (Rea et al., 2021). OHCA occurs when the heart stops pumping blood, resulting in loss of consciousness and reduced blood flow to vital organs, which is the initial clinical manifestation of heart disease. OHCA can occur at any age, and if not treated within minutes of onset, it can be fatal. The main causes of OHCA are usually related to cardiovascular conditions. According to Myat et al. (2018), ventricular arrhythmia, myocardial infarction, and heart failure are common causes of cardiac arrest.

The incidence of OHCA in the United States is reported to be around 170 per 100,000 people per year (Benjamin et al., 2019). Meanwhile, in countries with less developed emergency medical services (EMS) infrastructure, much lower figures are reported, often below 50 per 100,000 person-years (Vaduganathan et al., 2022). In Indonesia, data on OHCA are still limited, but several studies indicate that the incidence is quite high. The incidence of OHCA in Indonesia has not been thoroughly documented; however, deaths attributed to conditions leading to cardiac arrest,

specifically ischemic heart disease, account for 96 deaths per 100,000 population (WHO, 2024). This is related to the OHCA survival rate which has fluctuated. A multicenter study conducted in Europe found an overall survival rate of around 11%, with rates reaching as high as 22% in cities with established EMS systems (Huang et al., 2021).

Gräsner et al. (2020), showed that the overall survival rate for OHCA cases where cardiopulmonary resuscitation (CPR) was performed by bystanders was around 12%. In the United States, the survival rate for OHCA cases with CPR performed by bystanders reached around 38% in urban areas (Olasveengen et al., 2020). From these data, bystander CPR can increase the survival rate of victims if they quickly call EMS followed by performing appropriate CPR and AED (automated external defibrillator) actions. A study conducted in Japan reported that the survival rate for patients who received CPR by bystanders was around 20%, compared to only 5% for those who did not receive CPR (Kiyohara et al., 2022). This immediate response is crucial as brain damage can occur within minutes of cardiac arrest due to lack of oxygen.

CPR given within the first three minutes after the incident can increase the chances of survival by two-fold. However, in Indonesia, there are still obstacles in implementing CPR, especially in rural areas where health education is less accessible (Wyckoff et al., 2022). Public awareness of the importance of CPR and the use of automated external defibrillators (AEDs) also needs to be increased. In a study conducted in Heraklion City, only 10% of respondents knew how to perform CPR, and less than 5% knew about AEDs (Spartinou et al., 2022). Therefore, community education and training are important steps to improve the response to OHCA.

Since 2020, numerous countries have made significant progress in incorporating CPR training into educational programs. For example, in the United States, the American Heart Association initiated efforts to promote CPR training in middle and high schools, advocating for legislative measures that mandate such training as part of the health curriculum (Chocron et al., 2021). This initiative has proven successful in several states, with reports indicating an increase in student participation in CPR courses. CPR training in Slovenian public elementary schools, demonstrates that early education can enhance both confidence and willingness to perform CPR, resulting in higher rates of bystander intervention during cardiac emergencies (Pivač et al. 2020).

Video media has emerged as an effective instrument for CPR instruction. Such resources can clearly and engagingly demonstrate techniques, facilitating students' understanding and retention of the steps involved in performing CPR. A study by Ali et al. (2021), indicated that students exposed to CPR training via video exhibited significantly improved skill retention compared to those trained using traditional methods. Recent research has assessed the effectiveness of video-based CPR training specifically for middle school students. Pan et al. (2022), found that students who learned CPR through video tutorials achieved higher rates of skill acquisition and demonstrated superior performance in practical assessments relative to their peers trained through conventional approaches.

Confidence is a crucial determinant in whether individuals will intervene during an emergency. Studies have shown that students who feel confident in their CPR skills are more likely to act when confronted with a cardiac arrest situation. For example, a study by Yousefian & Mohamadirizi (2023), found that middle school students who received CPR training reported significantly higher levels of self-confidence in their ability to perform CPR compared to those who had not undergone training. Wulansari & Wirasakti (2022), also conducted CPR training on students in Jember with the results that there was a significant increase in student's confidence in performing CPR (from an average self-confidence score of 4 to 7). This confidence is essential, as hesitation in emergency situations can lead to adverse outcomes. This confidence also influences the willingness of bystander CPR to help OHCA victims. Willingness to perform CPR is influenced by several factors, including training quality, perceived competence, and psychological readiness. Research indicates that comprehensive training programs that include hands-on practice enhance both confidence and willingness. A study by Pivač et al. (2020) revealed that

students who participated in interactive CPR training reported a greater willingness to perform CPR compared to those who received only theoretical instruction.

Combining education about cardiac arrest and its treatment with CPR and the use of technology can be a solution for learning in school-age children through DSF (Documentary Short Film). In rural areas, access to quality educational resources and experienced educators is often constrained. Short documentary films can mitigate these challenges by delivering high-quality educational content that may not be readily available. Furthermore, these films can be seamlessly integrated into the curriculum, enabling teachers to enhance traditional lessons with relevant visual materials. Therefore, the aim of this research is to analyze the effect of DSF on enhancing student's confidence and willingness to perform CPR in rural areas.

Methods

This study employs a quasi-experimental design using a one-group pretest-posttest framework. It was conducted at a junior high school in Jember Regency, involving 72 students selected through proportionate stratified random sampling. The inclusion criteria for participants were: 1) junior high school students aged 11 to 14 years, 2) willingness to participate as respondents, and 3) engagement in the research activities from beginning to end. The educational method utilized was a simulation through a Documentary Short Film (DSF), which illustrates a scenario where a cardiac arrest victim receives assistance from a bystander CPR. The DSF emphasizes the immediate actions to take when encountering an OHCA victim, including promptly calling for an ambulance and administering CPR. To facilitate understanding, the DSF employs the local dialect spoken in the Jember Regency community, and it is accompanied by Indonesian subtitles along with a main headline summarizing the steps taken by the bystander. The total duration of the DSF is 12 minutes and 08 seconds.

This study was conducted in May 2023. It began with the administration of a pretest questionnaire, followed by a collective viewing of the Documentary Short Film (DSF) three times by the respondents, with each viewing lasting 30 minutes. The DSF was continuously shown while the respondents participated in simulation activities. One week later, a post test measurement was conducted. The data on respondents' self-confidence and willingness to perform cardiopulmonary resuscitation (CPR) were collected using a questionnaire that had previously undergone validity and reliability testing with a similar student population. The results of the validity test showed that 5 items from the self-confidence instrument and 10 items from the willingness instrument were considered valid. The results of the reliability test yielded a Cronbach's Alpha value of 0.835 for the self-confidence instrument and 0.924 for the willingness instrument. Univariate analysis was performed to assess the characteristics of the respondents and the individual variables related to self-confidence and willingness. Bivariate analysis utilized a paired t-test to evaluate changes in self-confidence and willingness.

Result

The characteristics of the respondents involved in this study are presented in the following table.

Table 1. Respondent characteristics

Characteristics	Frequency (f)	Percentage (%)
Age		
13 yo	46	64
14 yo	26	36
Gender		
Male	33	46
Female	39	54

According to the table above, the majority of respondents are 13 years old (64%) and female (54%).

Table 2. Students' confidence and willingness to perform CPR

Variable	Mean	Min	Max	p-value
Self-Confidence				
Pretest	5,78	5	7	0,000
Posttest	9,43	8	10	
Willingness				
Pretest	9,13	8	12	0,000
Posttest	15,68	14	16	

In Table 2, the data reveals that both p-values are < 0.05, signifying notable differences in students' self-confidence and willingness to perform CPR before and after the educational intervention using the DSF. The average self-confidence score among respondents rose from 5.78 (2 – 3 questions responding with 'confidence') to 9.43 (4 – 5 questions responding with 'confidence'), with the minimum score increasing from 5 to 7 and the maximum score going from 8 to 10. Additionally, the average willingness score showed an improvement from 9.13 (3 – 5 questions responding with 'willing') to 15.68 (7 – 8 questions responding with 'willing'), with the lowest score advancing from 8 to 12 and the highest score increasing from 14 to 16. To further explore the self-confidence and willingness of students in performing CPR, additional analysis is presented in Table 3.

Table 3. The differences in students' confidence and willingness on conducting CPR

Variable	Pretest (%)	Posttest (%)	Post Hoc Test
Self-Confidence			
Assessing the safety of the environment to provide assistance	42 (58,3)	71 (98,6)	0,000
Identifying an unresponsive victim	19 (26,4)	68 (94,4)	0,000
Calling for an ambulance	16 (22,2)	72 (100)	0,000
Assessing pulse and respiration	2 (2,8)	63 (87,5)	0,000
Performing CPR	0 (0)	69 (95,8)	0,000
Willingness			
Familiar people			
Family members	46 (63,9)	67 (93,1)	0,000
Friends	42 (58,3)	68 (94,4)	0,000
Dislike person	9 (12,5)	59 (81,9)	0,000
Unfamiliar people			
Different gender	15 (20,8)	48 (66,7)	0,000
Accident victims	6 (8,3)	20 (27,8)	0,000
Children	35 (48,6)	63 (87,5)	0,000
Elderly person	11 (15,3)	60 (83,3)	0,000
Homeless person	9 (12,5)	31 (43,1)	0,000

Based on the information presented in Table 3, it is clear that there are significant differences in all components of self-confidence and willingness among respondents in performing CPR before and after the training, with each p-value being < 0.05.

Discussion

Theories of learning, particularly those related to multimedia instruction, suggest that visual aids can significantly enhance retention and comprehension. According to Mayer's Cognitive Theory of Multimedia Learning, students learn more effectively when information is presented through both visual and auditory channels. This dual-channel processing is particularly beneficial for adolescents, who may struggle with abstract concepts. Video education helps to simplify complex ideas, making them more accessible and understandable for middle school learners (Mayer, 2024). Video education also allows for the contextualization of learning. Research by Mo et al. (2022) suggests that when students see real-world applications of concepts through video,

they are more likely to understand the relevance of what they are learning. In this study, the video media used was the Documentary Short Film (DSF), designed in accordance with the adult cardiac arrest management simulation guidelines set by the American Heart Association (AHA). The CPR video effectively simulates the management of cardiac arrest, featuring high-quality chest compressions with the recommended CPR rhythm, ventilations using a pocket mask and bag-valve mask, and a comprehensive overview from recognizing signs of cardiac arrest to treatment. This approach significantly enhanced the self-confidence and willingness of middle school students in rural areas to perform CPR.

The self-confidence of middle school students in performing CPR showed a significant improvement in this study. Prior to the educational intervention, the majority of respondents indicated "confidence" on only 2 – 3 out of 5 questions. However, following the education using DSF media, there was a significant increase in self-confidence among respondents, with most now indicating "confidence" on 4 – 5 questions.

Ko et al. (2023), revealed significant improvements in all questions related to students' confidence in performing CPR. The question that demonstrated the most substantial improvement was: “When you encounter a cardiac arrest patient in front of you, are you confident in performing CPR?” The number of schoolchildren who answered “Yes” increased from 51 (36.4%) to 112 (80.0%). The visual demonstration of techniques, combined with immediate feedback through interactive elements, significantly contributed to participants' perceived competence in performing CPR. The practical application of CPR skills is essential for effective learning. Students who practice CPR in a simulated environment, especially with the aid of video demonstrations, showed significant improvements in both their competence and confidence. The hands-on experience, combined with visual guidance, allows students to internalize the steps of CPR more effectively. The progression toward skill mastery is another critical component of self-confidence development (Waldemar et al., 2024). This is consistent with the findings from research by George et al. (2023) found that repeated exposure to video instruction enabled students to master CPR techniques more rapidly. As students become more proficient, their self-confidence increases, leading to a higher likelihood of performing CPR in real-life situations.

This study identified five components of self-confidence, all of which showed significant improvement after education using DSF. Additionally, the results revealed that all students responded "confident" for the component "calling for an ambulance," achieving a 100% rate. Calling for help represents a crucial initial step in the chain of survival during a cardiac arrest situation. This chain consists of several interconnected actions, each of which is vital in enhancing the patient's likelihood of survival. A prompt call for assistance activates the response of trained medical personnel and ensures the availability of necessary medical equipment. While bystanders can provide essential immediate aid through CPR, professional intervention is indispensable for administering advanced life support measures. Research indicates that the earlier emergency services are notified, the more favorable the outcomes for patients experiencing cardiac arrest (Hutton et al., 2023).

Willingness to perform CPR (Cardiopulmonary Resuscitation) is a crucial factor that is intrinsically linked to confidence in emergency situations. While confidence in one's ability to perform CPR is essential, the willingness to act can be the determining factor in whether lifesaving measures are taken. In this context, these two aspects mutually reinforce each other and contribute significantly to patient safety. In this study, the results indicated a significant change in students' willingness to perform CPR. Prior to the educational intervention, the majority of respondents answered 3 to 5 questions with "willing" out of a total of 8 questions. Following the intervention, this increased to respondents answering 7 to 8 questions with "willing." This study aligns with previous research conducted on nursing students, which demonstrated that training using preferred media video significantly enhances students' willingness to perform CPR (Wulansari & Wirasakti, 2022).

Park et al. (2020), in their study involving 1929 participants who received video-based self-instruction training, found that 91.4% of participants were highly willing to perform CPR on

victims of cardiac arrest. The authors noted that prior to the intervention, respondents expressed hesitation due to a lack of confidence and perceived ability. However, after engaging with the educational video, which effectively demonstrated the steps of CPR and emphasized the importance of timely action, participants reported feeling more prepared and willing to intervene during a cardiac arrest situation. Furthermore, the findings support the notion that the use of multimedia resources in CPR training not only enhances knowledge retention but also significantly increases participants' willingness to act. The visual and auditory components of video education serve to demystify the CPR process, rendering it more accessible and less intimidating for students. This heightened familiarity with the procedure fosters a greater sense of confidence and a stronger inclination to intervene when necessary (Mao et al., 2021).

The study's findings indicate that the use of DSF significantly enhances participants' willingness to perform CPR, as reflected in the individual components of the willingness questionnaire. The results regarding respondents' willingness to perform CPR indicate that the majority of respondents are more inclined to assist individuals they know rather than strangers. The lowest willingness was observed in respondents' readiness to help cardiac arrest victims who are accident victims (27.8%) and homeless person (43.1%). In contrast, the highest willingness was recorded for assisting family members (93.1%) and friends (94.4%). This suggests that DSF not only increased overall willingness but also positively influenced specific areas of preparedness assessed by the questionnaire.

Grunau et al. (2020), in their study on changes in bystander CPR willingness during the COVID-19 pandemic, found that respondents showed a decline of 14.3% in their willingness to perform chest compressions on strangers, while the decrease was only 1.6% for family members. This suggests that respondents were significantly less inclined to assist strangers compared to those they knew. Another study employing a simulation method using video in the workplace examined the willingness of bystanders to perform CPR on both familiar and unfamiliar individuals. The authors found that bystanders reported a higher likelihood of intervening when the victim was a family member or friend, as opposed to a stranger. This trend can be attributed to a sense of personal connection and responsibility often associated with relationships involving known individuals. The study revealed that 94,2% of participants expressed a willingness to perform CPR on acquaintances, while only 74,8% indicated a willingness to assist strangers (Jaskiewicz et al., 2022). Emotional factors significantly influence bystander decision-making. The research indicated that bystanders felt more comfortable and confident when providing assistance to individuals they knew, leading to higher intervention rates in familiar cases. In contrast, perceived uncertainty and fear of legal repercussions frequently deter individuals from performing CPR on unknown victims. The authors observed that individuals who had received CPR training were more likely to intervene in emergencies, irrespective of the victim's familiarity. This finding suggests that education and preparedness may help mitigate some of the barriers associated with assisting unknown individuals (Matsuyama et al., 2020).

In rural areas, where access to in-person CPR training is often limited, educational videos can provide a more accessible alternative. This enables a larger number of individuals to gain the essential knowledge and skills without having to rely on face-to-face training, which may not be readily available. Research by Luo et al. (2023) emphasizes the significance of technology-based approaches in enhancing first aid skills in remote communities, highlighting that participants' confidence and willingness in performing CPR increased after viewing the educational video. The increase in confidence and willingness to perform CPR has significant implications for community safety in rural areas. As more individuals feel empowered and inclined to intervene in emergencies, the potential for saving lives in critical situations rises markedly. Educational videos can serve as an effective tool in fostering a culture of assistance within communities, where every individual perceives themselves as having a role in saving lives.

Conclusion

The use of Documentary Short Films (DSF) for CPR training among middle school students in rural areas has proven effective in boosting both confidence and willingness to perform CPR. By harnessing this technology, we can reach a wider audience and better prepare individuals to respond in emergencies, ultimately enhancing community safety. Ongoing research is essential to assess the effectiveness of different types of educational content and delivery methods in improving first aid skills in rural communities.

Ethics approval and consent to participate

The study received ethical approval from the Ethical Clearance Committee of the Faculty of Dentistry at the University of Jember, reference number 2037/UN25.8/KEPK/DL/2023.

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