Received: 1 December 2023 | Revised: 10 March 2024 | Accepted: 19 April 2024

DOI: 10.1002/emp2.13183

JACEP OPEN
JOURNAL OF THE AMERICAN COLLEGE OF EMERGENCY PHYSICIANS OPEN
A GLOBAL JOURNAL OF EMERGENCY MEDICINE
WILEY

CLINICAL CONCEPTS

Education

A novel approach to community CPR and AED outreach focused on underserved learner communities

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Abstract

Creating a sustainable community cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) program that reaches underserved communities poses a challenge for the emergency medical services (EMS) community. Attendance, funding, and resources have all been linked to struggles surrounding community CPR/AED programs. Through our experience in conducting CPR/AED trainings in underserved regions of eastern North Carolina, we propose a method of effectively utilizing existing organizations and institutions of learning to expand and maintain a sustainable community CPR/AED program. Furthermore, we demonstrate 10 cornerstones in developing relationships within the community to increase attendance and participation in diverse communities.

KEYWORDS
bystander CPR, community CPR, health care disparities, out of hospital cardiac arrest

1 | INTRODUCTION

Effective bystander cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) use are valuable in the chain of survival for out-of-hospital cardiac arrest (OHCA).[1,2] In 2022, CARES data revealed a significantly higher survival to discharge rate in patients who received bystander CPR (11.3%) than in patients who did not receive bystander CPR (7.0%). Furthermore, early defibrillation by a bystander had significantly better outcomes (44% survived to discharge) when compared to defibrillation by responding emergency service units (25% survived to discharge).[3] However, even with the well-supported conclusions surrounding OHCA, low numbers of bystander-initiated CPR and AED use continue to be an issue throughout the healthcare system, as bystander CPR was only initiated in 40% of CARES patients, with AED use being even lower at 5.2%.[3]

Importantly, racial and ethnic disparities have been found in many bystander CPR/AED studies. For example, Black and Hispanic populations were significantly less likely to have bystander CPR performed at home or in public locations.[4,5] Studies have identified lack of financial and informational resources available to these populations as key barriers to CPR/AED initiation.[6,7] Methods of delivering meaningful and engaging education to these underserved communities continue to be a primary topic of discussion throughout emergency medicine. While CPR/AED education is not of new origin, finding resources and creating an appealing educational program have been limitations.[8] Furthermore, although many studies have diagnosed the issues in delivering CPR/AED education in disadvantaged communities, methodology focusing on these communities is limited in scope. Through the success of our community CPR/AED program, we have created guidelines for improving CPR/AED outreach for diverse populations. We describe building a community CPR/AED program with

Supervising Editor: Remle Crowe, PhD, NREMT.

focus on barriers faced by disadvantaged populations. In addition, we demonstrate that involvement with institutions of learning and community centers is an important piece of community CPR/AED outreach.

1.1 | Compress and Shock Foundation

The Compress and Shock Foundation is a 501(c)(3) organization that provides free community CPR and AED education to the public on a national basis, mainly through an annual national free CPR and AED Education Day, in addition to other local community initiatives. The Compress and Shock Foundation has created a "train the trainer" program for organizations wishing to host their own training and provides the infrastructure necessary for any community to participate in their model of community CPR and AED education. Founded in 2017, the mission of the organization was to bring free and equitable access to CPR and AED education to all communities, with a specific dedication to those communities most adversely affected by cardiac arrest due to race, ethnicity, primary language, or access to health care education. The training intentionally does not offer certification and can be tailored to any learning community, as evidenced by the numerous languages in which the education has been delivered. In addition to providing free hands-only CPR training, the organization has created a unique AED access program that provides free grant-funded AEDs to communities that align with the mission statement. As of August 2023, the organization has trained more than 8500 laypersons in hands-only CPR and placed more than 70 AEDs in underserved communities throughout the United States.

In recent years, our organization has achieved success throughout eastern North Carolina, with more than 1000 laypersons trained and 30 AEDs placed throughout the region. Specifically, eastern North Carolina refers to 41 counties east of Interstate 95, with 29 of these counties recording the poorest health in the entire state. Additionally, this region not only has the highest Black and Hispanic population in the state, but also the highest percentage of population that lives below the poverty line.[9] As a region tainted with health disparities, access to healthcare education and life-saving equipment is necessary. Due to these known disparities, our organization places focus on these demographics in eastern North Carolina. For example, one county (Bertie) in which a training was completed, and an AED was placed had the highest percentage of African–Americans in the state (62%), and of the state's 100 counties, the fifth highest percentage of the population was below the poverty line (25%).[9]

1.2 | Cornerstones for improving community CPR/AED outreach for the underserved

Through our experience in community CPR/AED outreach during the past 6 years, we have developed 10 cornerstones of CPR/AED education that are crucial to successful outreach to all communities.

1.2.1 | Take a "come to you" approach

It is challenging to incentivize community members to travel to a central location (fire stations, hospitals, universities, etc) to receive CPR/AED training, especially in communities with limitations to transportation. Successful community CPR/AED programs are portable and provide training where community members are already gathering—that is, church gatherings, existing festivals, etc. These may fall outside of a typical Monday through Friday work schedule, so a successful outreach program needs to be flexible in terms of time and day to accommodate the best-fit opportunity of the intended population.

1.2.2 | Provide an incentive

According to our experience, one of the most difficult aspects of community CPR/AED training is attendance. Participation increases when some form of incentive is provided. The Compress and Shock Foundation has focused engagement on grants for AEDs to distribute to communities in need. In our current model, an organization hosting our training (ie, church, community group, etc.) will receive a free AED if they have 35 or more individuals attend the training. This model has served us well by putting the responsibility on the hosting organization to ensure that 35 or more community members attend the training. This gives the organizations a tangible incentive to ensure attendance at training. In addition, this model also helps identify a "champion" within the learner community who will not only help recruit a minimum of 35 learners but also become the recipient of subsequent reminders to check the electrode pads and batteries of the donated AED and ensure that no AED is left unattended and inoperable.

1.2.3 | Avoid signups

There exists distrust of institutions among some of our underserved communities. People hesitate to give out their name, personal email, phone numbers, etc., and in some communities, there may be significant lack of access to phone and email. Additionally, there may be distrust of providing a name over fear of legal consequences. Therefore, we recommend against signups that require any personal information. A simple head count at the time of training is adequate to determine how many individuals were trained and to ensure that the community achieved the 35-learner requirement for free grant-funded AED donation.

1.2.4 | Highlight survivors

In comparison to other nonprofit and community outreach work, community CPR and AED are less tangible for many laypersons. For instance, it is easy to observe a tangible outcome when building houses in a local community, but the importance of preparation for cardiac

arrest is more difficult for laypersons to grasp. Highlighting a local survivor and integrating that individual into community engagement will help illuminate the importance of bystander CPR/AED training and public access AEDs. Survivors can be identified through personal clinic work, partnerships with local fire and EMS agencies, or collaboration with the local hospital cardiology service line.

1.2.5 | Find a local champion

A local champion who has a personal stake in improving community CPR/AED outreach can help recruit sites and participants for training. This could be a local celebrity, a family, or a friend of a cardiac arrest victim or survivor, or a cardiac arrest survivor themselves.

1.2.6 | Focus on barriers

A mainstay of community CPR/AED training is the incorporation of education on barriers to bystander intervention and how to empower the learner so that they will intervene. Common barriers include fear of litigation, fear of disease transmission, fear of hurting the victim, performing CPR when it is not necessary, unfamiliarity with an AED, or concerns over the level of personal fitness needed to perform effective chest compressions. Barriers can also be language or culturally specific, such as English language proficiency, concern over legal consequences if police respond (e.g., possible deportation), expenses involved in medical care, and poor understanding of the US 911 system. The populations in your communities that embody these barriers should be a focus of CPR/AED outreach.[10] The didactic portion of CPR/AED education should discuss common barriers and learner community-specific barriers (e.g., language).

1.2.7 | Partner for supplies

Purchasing CPR/AED training supplies can often serve as a barrier to community CPR/AED outreach. However, there are often local community resources that have accessible training supplies that are not consistently used. These may include community colleges, local EMS organizations, local hospitals, and companies offering private CPR/AED certification classes. Establishing a relationship can create access to said supplies from these organizations and limit the financial barrier to initiating a CPR/AED program.

1.2.8 | Arrange recurring community events

Maintaining a presence in the community via fundraisers, presence at existing fairs and sporting events, etc., helps maintain trust in community CPR/AED program. Also, a constant presence in the community helps recruit additional sites and organizations for training.

1.2.9 | Train the trainer

Many EMS agencies and fire departments do not have adequate resources to provide trainers. Additionally, one does not have to be CPR/AED certified or have a health care background to teach community CPR. Therefore, developing a "train the trainer" program by which laypersons can become community CPR/AED trainers can help escalate the scale of a community CPR/AED program. The Compress and Shock Foundation has developed a series of online videos followed by a short quiz whereby any individual can become an instructor.

1.2.10 | Partner with institutions of learning

Building relationships with institutions of learning such as colleges and universities can greatly improve the outreach of community CPR/AED programs. Not only do institutions of learning provide unique opportunities to train a larger population, but they also offer highly motivated faculty and students who can provide a support network for the CPR/AED program. As exemplified below, these motivated faculty and students help to greatly reduce the strain that many CPR/AED programs face with scheduling, resource management, and trainer availability. In addition, this novel network of supporters can pioneer new and diverse methods of delivering CPR/AED training within a community. Finally, while the community CPR/AED program receives a plethora of benefits from the partnership of institutions of learning, the faculty and students involved in this partnership benefit comparably. Furthermore, public speaking, diverse social interaction, leadership, and responsibility are all examples of potential self-improvement skills developed by students and faculty participating in a community CPR/AED program.

2 | RESULTS

2.1 | Developing a successful university partnership

The development of a partnership with an institution of learning can ensure the success of a community CPR/AED program. This partnership can be established through a variety of methods, however finding a particularly passionate student, faculty member, or organization is effective. The initial collaboration should be clearly designed to increase the outreach of the CPR/AED program. Therefore, once an initial connection is made with a student, for example, the student should be directed to reach out to other students within their networks for support of the CPR/AED program's effort.

In our case, a student initially connected with the Compress and Shock Foundation reached out to the East Carolina University Honors College to spark interest in other students becoming CPR/AED trainers and program supporters. Once interest was established, "train the trainer" events were held to establish a network of student trainers.

These student trainers were subsequently added to the Compress and Shock Foundation's communication system. Each trainer was required to attend a minimum of one CPR/AED training event prior to leading a CPR/AED training themselves. The influx of motivated trainers from the university, surprisingly sparked the addition of several new community CPR/AED trainings. For example, several students carried out a formal CPR/AED training to all incoming freshmen within the university's honors program (nearly 300 freshmen). In addition, two community CPR/AED trainings, led solely by students, created an invitation for the students with the community organization to lead another CPR/AED training for a different population. It should be noted that while a few of the students involved throughout our program had prior medical training or certifications, most did not.

Additionally, the Compress and Shock Foundation has entered a partnership with the Office of the Vice President of Health Equity and Social Impact for ECU Health. Through preexisting contacts in the community, this office recruited 33 sites for training in underserved communities in the eastern North Carolina region. Using our 10-cornerstone model, our team travels to each site to provide the trainings. Each site establishes "local champions" which solidifies the relationship between our organization and the community partner. In these trainings, we have avoided using signups and have created simplified educational content that focuses on the barriers faced by these underserved communities. Additionally, we have a cardiac arrest survivor and his wife, who performed CPR on him, who joined us during trainings. While we did not seek community partners for our supplies due to supplies provided by the Compress and Shock Foundation, we have developed relationships with partners if additional supplies are needed. During these 5 months, this partnership has trained 932 individuals in community CPR/AED and distributed 41 free AEDs to communities in need. This training was completed with volunteer student instructors recruited through the "train the trainer" program. At the time of writing this article, we have an additional 11 sites scheduled or in the process of scheduling, which could add at least another 385 trained in the next 3 months.

3 | DISCUSSION

The development, expansion, and sustainability of a community CPR and AED program is an important aspect of every community. With each community experiencing a diverse set of challenges with cardiac arrest education, a specifically designed community CPR and AED program that follows our 10 cornerstones can work to address these challenges. A limitation to this novel approach to community CPR and AED outreach is providing incentives for learner communities. While other incentives may be explored in the future, the current success with the AED placement model is limited by the cost of the AEDs. Additionally, since these training is entirely volunteer based, scheduling can be a barrier. However, developing a large base of volunteers can help to overcome this barrier.

4 | CONCLUSION

Reaching underserved populations remains a crucial yet challenging aspect of community CPR/AED outreach. Implementing the ten cornerstones of CPR/AED outreach is important for eliminating the barriers faced by many CPR/AED programs. While these cornerstones provide an outline for developing a successful CPR/AED program, understanding the needs and desires of each individual community is vital. Our model embraces this idea by focusing on the learner community and adapting to their situation. Also, our model shows that partnering with institutions of learning and embracing a "train the trainer" mentality provides a sustainable pathway for community CPR/AED training. Even if your community does not have access to institutions of learning, adopting the other nine cornerstones will provide a framework for an effective CPR/AED program that can reach all communities.

ACKNOWLEDGMENTS

We would like to thank Alexis Henderson and Tony Parker for their support.

CONFLICT OF INTEREST STATEMENT

The authors declare they have no conflicts of interest.

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How to cite this article: Fisher AR, Bouland AJ, Zemple R, Jackson KSJ, Perkins J. A novel approach to community CPR and AED outreach focused on underserved learner communities. *JACEP Open*. 2024;5:e13183. https://doi.org/10.1002/emp2.13183