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The motorcycle-taxi cardiopulmonary resuscitation (CPR) project in the Bangkok-Noi District of Bangkok, Thailand



SITUATION

Thailand, a low-middle income country in the Southeast Asia region, reported in the Pan-Asian Resuscitation Outcomes Study (PAROS) that only 16% of out-of-hospital cardiac arrest (OHCA) patients received bystander cardiopulmonary resuscitation (CPR), and the survival-to-discharge rate was 4%. This article presents an OHCA initiative implemented in the Bangkok-Noi District in Bangkok, the capital city of Thailand. The project aimed to be a model for other areas in Thailand and other low-middle-income countries. The Bangkok-Noi District has a population of 100,000 population living in a 12-square-kilometer semiurban slum community. Most people in the slum community use narrow pathways for transportation by walking or motorcycle-taxi. When OHCA occurs in the Bangkok-Noi district and surrounding areas, the majority of cases are transported to Siriraj Hospital, the largest university hospital in Thailand. The data from Siriraj Hospital found 127 OHCA cases occurred in 2018. Although the majority of them (74%) were reported as witnessed arrests, only 27% of the patients received bystander CPR. Around half of the OHCA cases (52%) were transported to the hospital by the emergency medical service (EMS) team. The 30-day survival was only 12%.

INTERVENTION(S)

In 2019, the Siriraj EMS center, a hospital-based EMS operated by Siriraj hospital, conducted the motorcycle-taxi CPR project. The deliverable aimed to include CPR-certified motorcycle taxi riders and other volunteers as community first responders (CFRs) and to develop a mobile crowdsourcing application called Siriraj Emergency Responder Application (SiER app). The application was able to identify the victim's location and dispatch a CFR to the scene. There were reasons why the project focused on motorcycle-taxi riders. First, as mentioned earlier, the Bangkok-Noi district is difficult to access by ambulances, especially in the slum communities. And the district had more than 2,000 registered motorcycle-taxi riders in more than 100 spots. The GRA's Step 7 "Use smart technologies to extend CPR and public access defibrillation programs to notify volunteer bystanders who can respond to nearby arrest to provide early CPR and defibrillation" inspired this program.

Our team conducted ten community-CPR courses from March 2019 to December 2019 to provide knowledge about the EMS system and hands-only CPR. During the CPR training sessions at motorcycle-taxi parking areas, we recruited motorcycle-

taxi riders and other volunteers to be certified CFRs. We conducted CPR test sessions to certify our CFRs were ready to respond. The project also tested 12 simulated scenarios in the slum communities in the Bangkok-Noi district. The process indicators were the number of certified CFRs and the percentage of motorcycle-taxi riders among the certified CFRs. Furthermore, we measured bystander CPR rate and survival outcomes from our OHCA registry.

This project was under the Bangkok-Noi model project, funded by the Faculty of Medicine Siriraj Hospital, Mahidol University, and the Thai Health Promotion Foundation. During the implementation, the project was well-supported by the community. Community leaders helped us advertise the courses, invite the motorcycle-taxi riders, and provide the course venues. However, the project implementation barriers included the lack of automated external defibrillators (AEDs) in our area and a technology gap for our CFRs to use the SiER app. Moreover, our target group was of low-socioeconomic status; therefore, it was difficult for them to attend whole classes because they interfered with work or home life. Lastly, after the implementation, the COVID-19 outbreak in our community in April 2020 forced us to suspend the project. We are planning to resume the project in July 2022.

LIFE-SAVING IMPACT

We reported our results in a recent publication². During the implementation, we taught 355 laypersons, and 39 of those were motorcycle-taxi riders (11%). Among our cohort, 156 (44%) trainees became certified CFRs. Of those, 10 motorcycle-taxi drivers became CFR certified (6%). The data from our OHCA registry revealed that there were 127 OHCA cases in 2018, and 187 cases in 2020. The data shows a significant increase from 2018 to 2020 for both EMS utilization (52% vs. 76%; $p < 0.001$) and bystander CPR rate (27% vs. 44%; $p = 0.002$). In contrast, 30-day survival was significantly decreased from 12% in 2018 to 2% in 2020 ($p < 0.001$). Although our initiative significantly increased the bystander CPR rate but did not improve 30-day survival. This may be explained by the fact that our community did not have enough public AEDs. Furthermore, it might be due to the impact of the COVID-19 outbreak in our community.

Even though the project is just getting started, we hope that this initiative from a low-middle-income country will inspire other areas to improve OHCA survival.

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