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Original Research Article

Barriers to dispatcher-assisted cardiopulmonary resuscitation in Thailand

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ABSTRACT

Background: Dispatcher-assisted cardiopulmonary resuscitation (DA-CPR) has proven effective in boosting bystander CPR rates in out-of-hospital cardiac arrests (OHCA). Recently, Thailand has implemented a DA-CPR program. Our objective was to delineate the obstacles to initiating chest compressions by callers.
Methods: We reviewed dispatch recordings of OHCA cases received by the ambulance call center from July 2012 to March 2015. Excluding audio recordings of subpar quality, trained evaluators documented the successive stages of the dispatcher's CPR recognition, delivery of CPR instructions, and the caller's execution of CPR. The time required to achieve these milestones was recorded, while barriers hindering chest compressions were identified.
Results: Throughout the study period, researchers identified 280 cases of OHCA. Among these cases, it was observed that 134 bystanders declined to administer CPR. Reasons for refusal varied: 25.4% cited difficulty in controlling their emotions, 21.65% encountered challenges accessing the scene, 20.9% refused to perform CPR, 14.9% dropped out of the call, 9.7% did not approach the emergency patient, 5.9% were unable to perform CPR due to physical limitations, and 2.9% faced difficulty moving the emergency patient to the ground floor.
Conclusions: Barriers were present in 47.85% correlating with a reduced proportion of CPR initiation and longer delays in CPR initiation.

Keywords: Bystander CPR, Emergency medical dispatchers, Emergency medical service, OHCA, CPR training

INTRODUCTION

Out-of-hospital cardiac arrest (OHCA) stands as a prominent cause of mortality worldwide reflecting global patterns.[1] Throughout the Asia-Pacific region, OHCA survival rates remain generally low, ranging from 2 to 11%.[2] Moreover, this ranging was drop down to 0.5-8.5% in 2015.[3] Specifically, in Thailand, the survival rate for hospital discharge was measured at discharged alive after 30 days, comprising 22 (8.6%), 8 (3.0%), and 12 (1.7%) from regional, suburban-capital, and urban-capital centers, respectively.[4] Effective management of OHCA crucially relies on the "chain of survival" paradigm, emphasizing prompt initiation and seamless execution of

rescuer interventions. An essential element of this chain is the early initiation of CPR, known to enhance OHCA outcomes significantly.[5] Given that OHCA incidents typically occur outside the immediate reach of healthcare professionals, timely CPR initiation heavily depends on bystanders' recognition of cardiac arrest and their administration of CPR, which can more than double the patient's likelihood of survival, especially in long-term outcome.[6,7]

Recently, dispatcher-assisted CPR (DA-CPR) has emerged as a potent intervention aimed at bolstering bystander CPR rates and consequently improving OHCA outcomes.[8] This approach operates on the premise that when a bystander contacts emergency medical services (EMS), the call not only triggers dispatch assistance but also presents an opportunity for EMS personnel to prompt recognition of cardiac arrest and prompt initiation of bystander CPR through systematic questioning and real-time pre-arrival instructions. Indeed, DA-CPR has demonstrated the potential to nearly double the percentage of OHCA patients who receive bystander CPR.[9]

The research conducted across different regions of Asia has revealed that the percentage of OHCA victims receiving bystander CPR ranges from 10.5 to 79.0 percenatges.[10] However, the survival-to-discharge rate is as low as 4 percenatges.[3] Nowadays, Thailand's population has a greater number of bystander CPR training in the community.[11-16] Given this context, there was a belief that DA-CPR by emergency medical dispatchers (EMDs) could be valuable in improving bystander CPR rates. However, offering regular CPR education or training to lay rescuers could enhance the quality of bystander CPR by utilizing an efficient DA-CPR protocol, consequently resulting in better outcomes for individuals experiencing sudden cardiac arrest. It suggests that individuals who undergo frequent CPR education or training become adept at this life-saving.[16] Similarly, within the DA-CPR protocol, the median time from notification to the initiation of chest compressions performed by a bystander was thirty-nine seconds. In contrast, the median interval between notification and the start of chest compressions instructed over the phone was two hundred ninety-eight sec.[17] Therefore, numerous factors can deter a bystander from performing CPR. These include concerns about contracting an infection, the lack of personal protective equipment (PPE), and discomfort with administering CPR to a stranger or someone unfamiliar in Indonesia.[18] We hypothesized that DA-CPR would facilitate a higher incidence of CPR administration by addressing some of the barriers encountered by the emergency callers. Insights gained from this investigation could guide the implementation of DA-CPR in other developing emergency medical services (EMSs) systems in the Thailand. This study sought to identify the barriers hindering callers from initiating chest compressions.

METHODS

We undertook a retrospective cohort study of OHCA incidents within a major metropolitan EMS system in 3 regions; Mahasarakham (Northeast), Songkhla (South), and Prachinburi (Central), from January to December 2021. OHCA cases occurring after EMS arrival and those not in cardiac arrest at the time of the 1669 call were excluded a priori. Approval for the study was obtained from the human research ethics committee, at Mahasarakham university no. 208-238/2565

Data for OHCA patients treated by bystanders in 2021 were gathered retrospectively. Audio recordings linked to these incidents underwent review by EMDs using a comprehensive checklist covering all pertinent variables. Inclusion criteria comprised OHCA patients who sought assistance via a bystander's call to the dispatch center and were subsequently transported to the hospital by emergency medical providers. Exclusions were made for cardiac arrest cases occurring in nursing homes, doctors' offices, jails, or unknown locations, with a focus on non-healthcare professionals. Additionally, cases were excluded if a language barrier impeded the dispatch process, if emergency medical providers witnessed the OHCA, or if the caller was not present with the patient. Calls were further excluded from CPR process analysis if bystanders performed CPR before receiving CPR instructions, or if the audio was incomplete or fragmented. The DA-CPR protocol mandates compression-only CPR for adult arrests, with EMDs expected to provide CPR instructions upon reports of unconsciousness, apnea, or agonal breathing.

Measurement and analysis

The authors defined DA-CPR as CPR instructions initiated by EMDs, prompting bystanders to start chest compressions. The reason why the bystander did not perform CPR is described as the bystander's decision not to administer CPR even after receiving instructions from EMDs upon recognizing signs and symptoms. Data on the variables related to bystander refusal to perform CPR were gathered using the Pan-Asian resuscitation outcomes study (PAROS) dispatcher CPR form.[19] Data collection involved the PAROS dispatcher CPR form and qualitative information from dispatchers. Descriptive statistics and content analysis were employed for data analysis.

RESULTS

From the characteristics of the OHCA as indicated in Table 1, the majority of calls were made by relatives (72.5%). Additionally, a significant proportion (91%) of callers had never undergone CPR training. Exploring general characteristics relevant to CPR, certain variables were identified, including the location of the incident (resident or public), and the relationship between the informant and the patient. While a small number of

bystanders had received CPR training, the majority of those attempting CPR were relatives of the cardiac arrest victims.

Table 1: Characteristics of OHCA (n=280).

List	N (%)	P value
Gender		
Male	197 (70.4)	0.011
Female	83 (29.6)	
Age (in years)		
<60	107 (38.2)	0.074
60-69	57 (20.4)	
70-79	60 (21.4)	
80 up	56 (20)	
Place		
Resident	231 (82.5)	0.000
Public	49 (17.5)	
Relation to callers		
Relative/ parent	203 (72.5)	0.000
Other bystanders	77 (27.4)	
Caller's experience in CPR training		
Yes	25 (8.9)	0.090
No	255 (91)	
Bystander perform CPR		
Yes	146 (52.1)	0.000
No	134 (47.9)	

Table 2 reveals that the primary reasons for CPR refusal primarily hinges on dispatching before receiving instructions. The inability to manage emotional distress while providing life-saving assistance also emerges as a significant factor, often stemming from close relatives, facing difficulties accessing the area to provide aid, or feeling too old or physically weak to perform CPR. Furthermore, it's noted that some bystanders refuse to perform CPR for multiple reasons.

Table 2: The reasons why the bystander did not perform CPR (n=134).

Reasons for refusal to perform CPR	N (%)	P value
Caller hang up the phone	20 (14.9)	0.000
difficulty in controlling their emotions	34 (25.4)	0.003
Difficult patient access	29 (21.7)	0.000
Caller refused CPR	28 (20.9)	0.000
Caller left the phone	16 (11.9)	0.000
Caller not with the emergency patient	13 (9.7)	0.032
Caller unable to perform CPR due to physical limitations	8 (5.9)	0.182
Could not move the emergency patient to the ground floor	4 (2.9)	0.035

The qualitative data about the reasons why the bystander did not perform CPR.

Difficulty in controlling their emotions

When there's a report of OHCA and the caller is overwhelmed by fear and concern, especially if the patient is a close relative, EMDs should exhibit patience, empathy, and support. They should listen attentively, understand the caller's emotional state, and gently guide them through the provided instructions, helping them regain composure.

Caller left the phone

After receiving the call, EMDs must take time to inquire about the incident location to accurately and promptly provide the rescue team with the coordinates to reach the scene. This is because the current system cannot identify the location of the caller, and some phone lines cannot record the caller's number. Consequently, callers may become frustrated, unwilling to wait for instructions, thinking it's a waste of time, and hastily decide to go to the scene themselves. Conversely, emergency response teams may waste more time and arrive late at the scene due to unclear location information, necessitating a callback to the caller to obtain clear coordinates. This results in further delays and increased tardiness in reaching emergency patients. As a result, more time is needed for inquiries, typically 30-40 seconds. This reflects the lack of understanding of the emergency medical system by callers and the expectation that EMDs will know the location automatically. Sometimes, calls originate from different districts, while the dispatched center is located in the main district of each province, complicating the process.

Caller refused CPR

Bystanders often hesitate to perform CPR due to a lack of confidence in their abilities and concerns about potentially harming the patient. In such instances, EMDs can provide invaluable assistance by offering guidance on CPR procedures. They may also enlist the help of individuals with CPR experience nearby, ensuring that the person assisting is both confident and physically capable of administering CPR effectively.

Lack of knowledge and experiences to evaluate agonal breathing

In many situations, it is commonly found that callers are unable to assess whether emergency patient is breathing abnormally or not, often responding that they are still breathing (33/134). As a result, EMDs may overlook guiding CPR and other emergency codes that do not imply OHCA until emergency response team arrives and assesses situation, leading to delayed initiation of CPR.

DISCUSSION

In this research, bystanders might opt out of administering CPR because of their lack of confidence

and fear of causing harm to the patient, a sentiment echoed in analogous studies conducted in the USA.[20] Additional obstacles include panic and challenges associated with moving patients into a supine position, mirroring findings from a 2018 study.[21] However, scoping reviews have revealed three primary categories of factors contributing to the reduced willingness to perform CPR: (1) personal factors such as emotional distress, panic, and hysteria; (2) CPR knowledge such as abnormal breathing recognition, lack of confidence; and (3) procedural issues.[22]

Even though over half of individuals (52%) were administering CPR, this figure falls short in comparison to developed countries like the USA, where 75% of bystanders have performed CPR and more than 5.4 million individuals trained in CPR globally in 2019.[23,24] The perception of uncertainty regarding correctness persisted, as only 8.9% had received CPR training, suggesting that lack of prior training might lead to incorrect application. Therefore, the benefits of bystander CPR in enhancing survival rates in OHCA could be compromised by the poor quality of CPR.[25]

The research revealed that OHCA predominantly takes place in domestic settings (82.5%), leading to family members being the primary bystanders in 72.5% of cases. Moreover, 52% of all OHCA cases received CPR administered by their relatives. Numerous studies corroborate the idea that family members are more inclined to initiate rescue efforts than non-relatives. Family members were more inclined to perform BCPR than strangers.[26] This aligns with a survey in China where respondents expressed a readiness to perform life-saving interventions like CPR for family members at a rate as high as 98.6%, whereas the willingness decreased significantly to 76.3% for non-family members.[27]

The researchers believe that since the majority of bystanders have not received CPR training, they are unlikely to perform CPR correctly, both in terms of the rate and depth of chest compressions, which is consistent with the findings of the other study.[28] However, while collecting data via audiotape, it is not clear whether the CPR instructions given by the EMDs were followed accurately by the bystanders, and how they performed chest compressions.

CONCLUSION

The research identified several barriers impeding bystander CPR delivery, predominantly arising from knowledge and skill deficiencies among callers. The authors suggested that tackling these, alongside other procedural obstacles associated with emergency calls, could be addressed through public education campaigns. Future studies should explore experimentation among bystander groups lacking training but receiving CPR guidance to enhance CPR training and DA-CPR.

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