

Are trained individuals more likely to perform bystander CPR? An observational study

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Introduction

- High mortality of OHCA cases is an important clinical issue
- Successful resuscitation after OHCA depends on early initiation of CPR and defibrillation
- Bystanders CPR could potentially double survival after OHCA
- The association of people's CPR training with their subsequent resuscitation performances and patient outcomes after OHCA.

Methods

- Patient:
OHCAs of intrinsic origin
- Rescuer:
The one who called an ambulance or the one who performed CPR

Table 2
Resuscitation performances according to rescuer's CPR training experience.

	Trained (n=66)	Untrained (n=66)	p-Value
Bystander CPR, n (%)	45/66 (75.0)	28/66 (43.3)	0.001
Previous CPR training, n (%)			
Within a year	17/21 (81.0)	-	-
Between 1 and 3 years	9/12 (75.0)	-	-
Over 3 years	17/25 (68.0)	-	-
Bystander CPR with telephone CPR instruction, n (%)	32/37 (86.5)	26/37 (70.3)	0.157
Number of witnesses, >2, n (%)	44/66 (77.3)	28/66 (46.2)	<0.001
Number of CPR performers, >2, n (%)	17/45 (37.8)	3/28 (11.5)	0.027
Knowledge of AEDs, n (%)	53/66 (88.3)	27/66 (45.6)	<0.001
Knowledge of the neighborhood AED location, n (%)	22/66 (39.4)	7/66 (13.4)	0.043
Using of AED, n (%)	6/15 (40.0)	0/0 (0.0)	-
Resuscitation time, mean, median (IQR)			
Collapse to call ^a	2.5 (-2.0-17.8)	3.0 (-3.0-30.8)	0.918
Collapse to bystander CPR	2.0 (0.0-17.0)	2.0 (1.0-6.0)	0.765
Call to guided CPR via telephone ^b	0.0 (0.0-2.0)	0.5 (0.0-2.0)	0.899

CPR denotes cardiopulmonary resuscitation; AED, automated external defibrillator; IQR, interquartile range.

^a Data available for witnessed patients (n=18 in trained group, n=28 in untrained group).

^b Data available for witnessed patients with CPR (n=12 in trained group, n=6 in untrained group).

^c Data available for patients with bystander CPR and who received telephone-guided CPR (n=23 in trained group, n=22 in untrained group).

Results-rescuers

- The proportion of bystander CPR significantly greater in the trained rescuer group than in the untrained rescuer group (75.0% vs 43.3%)
- In the trained rescuer group, the proportion of bystander CPR was greater in those with recent CPR training.
- Rescuers who had experienced previous CPR training were 3.4 times more likely to perform CPR (compared with those without such experience).

Results-rescuers

- Attitudes toward AEDs
The proportion of those who had knowledge of AEDs and the neighborhood AED location were significantly greater in the trained rescuer group than in the untrained rescuer group. 6 rescuers in the trained rescuer group actually used an AED, while none in the untrained rescuer group used it.

Results-rescuers

- Middle-aged (40–64) years rescuers and female patients were associated with lower proportion of bystander CPR.
- ☆ Surprisingly, patients with witnessed arrest were less likely to receive bystander CPR compared to those without it

Table 3

Patient outcomes according to rescuer's CPR training experience

	Trained (n=98)	Untrained (n=98)	p-Value
VF as initial rhythm, n (%)	10 (10.2)	5 (5.1)	0.135
Pre-hospital ROSC, n (%)	14 (14.3)	14 (14.3)	1.000
Hospital admission, n (%)	11 (11.3)	17 (17.3)	0.280
One-month survival, n (%)	8 (8.3)	5 (5.1)	0.279
Neurologically favorable one-month survival, n (%)	2 (2.0)	1 (1.0)	0.500

VF denotes ventricular fibrillation; ROSC, return of spontaneous circulation.

Results-patients

- One-month survival was 13.3% in the trained rescuer group, while 8.3% in the untrained rescuer group
- Neurologically favorable one month survival was 3.3% in the trained rescuer group, against 1.7% in the untrained rescuer group
- Number of survivors too small to evaluate the difference between the groups.

Discussion

- In this study, the EMS personnel interviewed the actual rescuers at the scene which assured the quality of data and minimized recall biases.

Discussion

- The experience of CPR training could improve rescuers willingness to perform CPR and could result in better patient outcomes after OHCA.

Discussion

- Providing CPR instructions
Previous studies reported that CPR instruction by dispatchers could encourage lay rescuers to perform CPR and improve the quality of CPR performed by bystanders with previous CPR training
- Both CPR training and telephone CPR instruction could increase bystander CPR.

- Attitudes toward AED

CPR training increased the knowledge of not only an AED itself but also the neighborhood AED locations, which suggested that CPR training engaged their attention to AEDs

Discussion- patients with witnessed arrest were less likely to receive bystander CPR

- One potential explanation for this paradox maybe patients' agonal breathing in the early stage of cardiac arrest, which is observed in nearly half of witnessed cardiac arrests and can easily mislead rescuers about patient vital states. Other multiple reasons (e.g., panic, fear of failure, embarrassment and so on) could decrease the willingness of bystanders to start CPR
- Improvements in the contents of CPR training program such as the recognition of agonal breathing should also be taught to increase CPR

Discussion-limitations

- data on the quality of bystander CPR were unknown in this study.
- bystander information was obtained by interviewing the bystanders themselves, and some recall bias might exaggerate our study results
- might still be unmeasured but influential confounding factors

Conclusion

- rescuers who had CPR training were more willing to perform CPR at the OHCA scenes than those who had not.
- CPR by bystander is strongly linked to improved patient survival, CPR training could yield better outcomes after OHCA
- Further studies are needed to prove the effectiveness of CPR training on survival.