

The Effectiveness of a New Dispatcher-Assisted Bystander CPR Program on CPR Quality: A cluster randomized controlled trial

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Introduction

Immediate provision of bystander CPR after Out-of-cardiac arrest (OHCA) is known to increase survival rate and good neurological outcomes. Dispatcher-Assisted CPR (DA-CPR) has been implemented to improve bystander CPR rate and survival outcomes.

Objective

This study aimed to determine whether a new dispatcher-assisted basic life support (DA-BLS) training program is associated with improved quality in CPR training.

Methods

This was a prospective, clustered randomized clinical trial conducted in three district health community centers in Seoul. Intervention was a new DA-BLS training program and control was standard BLS program. Primary outcome was total number of chest compression during the course of the training. The secondary outcome was an average compression depth and tertiary outcome were other CPR quality parameters and post-training survey results. Difference in difference (DID) analysis was performed to show whether CPR quality parameters were improved from baseline to last session during the training period.

Results

A total of 152 classes (1,929 trainees) were included in the final analysis. The intervention group showed significantly higher average number of chest compression compared with the control group (604 vs. 431). Overall, trainees in the intervention group showed better CPR quality indicators compared with control group throughout the course. However, both groups showed decreased in CPR performances from baseline to last session in all CPR quality parameters. DID analysis showed less changes in all of the quality parameters from baseline to last session in intervention group ($p < 0.01$ for all). In the post-training survey, disagreement rate in voluntariness about bystander CPR was significantly lower in the intervention group.

Conclusions

The new DA-BLS training program provided more number of chest compressions and related overall better CPR quality parameters.

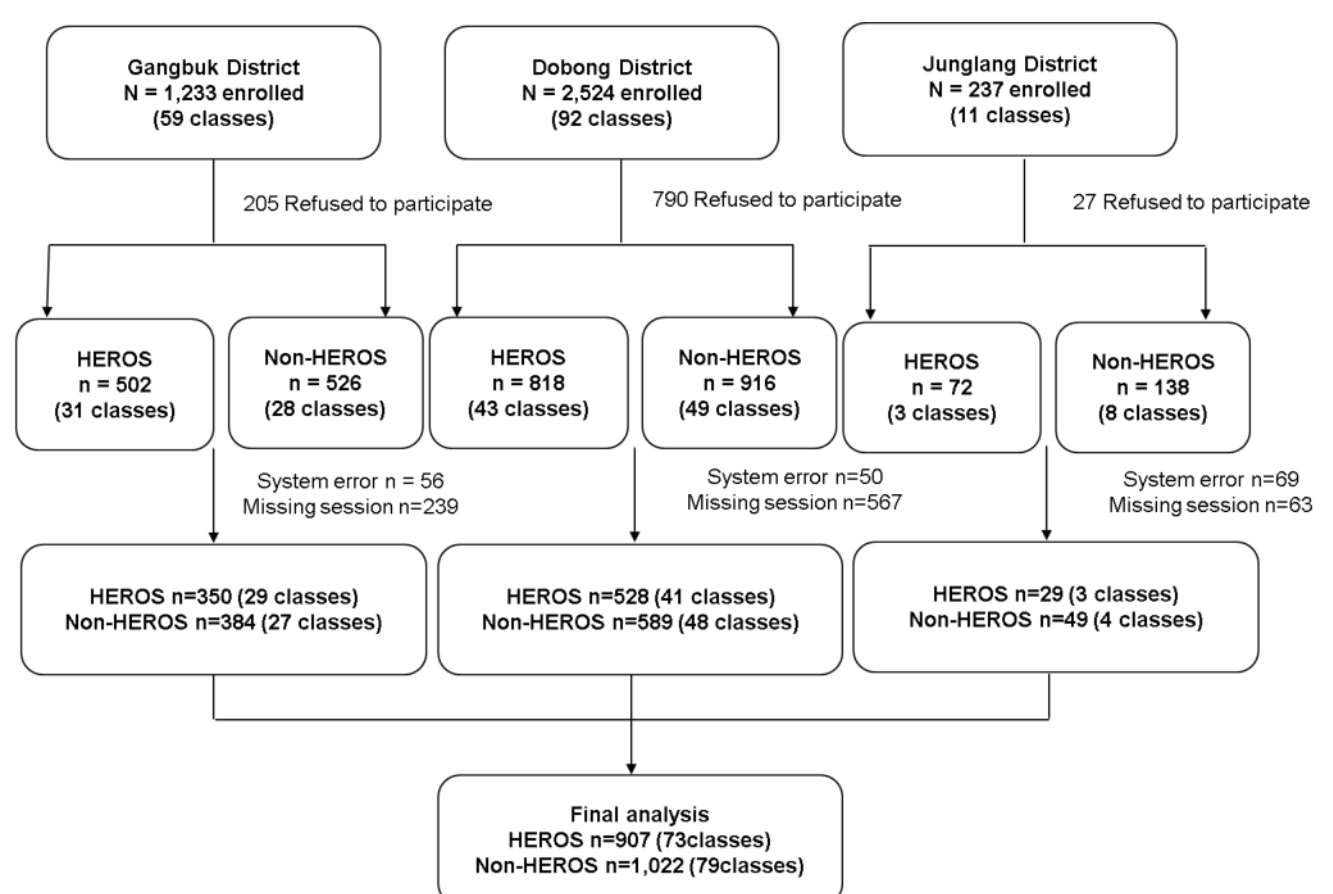


Fig.1 Flow of participants through the trial

	HEROS (n= 907)	Non-HEROS (n= 1,022)	Between Group Difference (DID, 95% CI)	p-value
<i>Primary Outcomes</i>				
Average total number of chest compressions, mean (SD)	604 (158)	431 (186)	---	<0.01
High performance (≥ 500 compressions during the course), n (%)	758 (83.6)	410 (40.1)	---	<0.01
<i>Secondary Outcomes</i>				
Total Score				<0.01
Baseline, mean (SD)	84 (20)	80 (22)	2.9 (0.2 to 5.5)	
Last session, mean (SD)	72 (36)	67 (38)	3.9 (1.3 to 6.6)	
Δ Baseline to last session (95% CI)	-12.2 (-14.9 to -9.4)	-13.2 (-15.8 to -10.6)	1.0 (-2.7 to 4.8)	
Average Compression Rate (per minute)				<0.01
Baseline, mean (SD)	110 (9)	110 (9)	-1.4 (-4.4 to 1.5)	
Last session, mean (SD)	98 (45)	92 (47)	4.9 (2.0 to 7.9)	
Δ Baseline to last session (95% CI)	-12.2 (-15.2 to -9.2)	-18.6 (-21.4 to -15.8)	6.4 (2.2 to 10.5)	
Average Compression Depth (mm)				<0.01
Baseline, mean (SD)	57 (9)	57 (10)	0.1 (-1.5 to 1.8)	
Last session, mean (SD)	51 (24)	48 (25)	2.9 (1.3 to 4.6)	
Δ Baseline to last session (95% CI)	-6.1 (-7.8 to -4.4)	-8.9 (-10.5 to -7.3)	2.8 (0.5 to 5.2)	
Percent Adequate Depth (%)				<0.01
Baseline, mean (SD)	75.2 (31.7)	74.1 (31.3)	0.5 (-2.7 to 3.7)	
Last session, mean (SD)	73.5 (39.0)	66.7 (41.0)	6.2 (3.0 to 9.3)	
Δ Baseline to last session (95% CI)	-1.7 (-5.0 to 1.6)	-7.4 (-10.4 to -4.3)	5.7 (1.2 to 10.1)	
Percent Acceptable Release (%)				<0.01
Baseline, mean (SD)	77.1 (30.5)	76.3 (29.8)	0.5 (-2.7 to 3.6)	
Last session, mean (SD)	64.4 (39.5)	60.1 (40.5)	4.0 (0.9 to 7.2)	
Δ Baseline to last session (95% CI)	-12.6 (-15.9 to -9.4)	-16.2 (-19.2 to -13.1)	3.5 (-0.9 to 8.0)	

SD=standard deviation; CI=confidence interval; Δ =change; DID=difference in difference

Table 1. Quality of CPR performance outcomes by intervention group