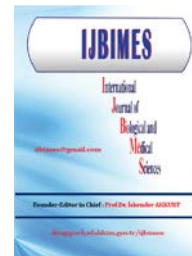


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Research Article

## Skill Performance in Cardiopulmonary Resuscitation Among Laypersons and Health Care Professionals #

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### Keywords

Cardiopulmonary resuscitation  
CPR skill  
Basic life support.

**Abstract:** Cardiopulmonary resuscitation (CPR) is the key determinant for survival from out-of-hospital cardiac arrest. The skill and ability of the rescuer to perform quality CPR are important to assure the success or failure of survival. This study aims to explore the differences and factors that affect performance of CPR skills, by taking into account demographic variations between the Health Care Professionals (HCP) and laypersons. A total of 144 responders were interviewed using a self-administered questionnaire and a skill evaluation checklist by two qualified instructors. HCP and laypersons groups report comparable skill retention in CPR but HCP shows better basic life support (BLS) knowledge. Results suggest female HCP has better BLS knowledge compared to male HCP and time length after first BLS course contributes to significant difference in BLS knowledge among laypersons. Laypersons who had attended refresher course have better CPR skill retention compared to those who had not.

## 1. INTRODUCTION

Out-of-hospital cardiac arrest is a major cause of death world wide and predominantly due to cardiac disease related[1]. Based on the cardiac arrest statistics, the incidence of out-of-hospital cardiac arrest in United States of America in 2013 was 359400. Overall, 40.1% cases involved bystander cardiopulmonary resuscitation (CPR), with survival rate at only 9.5%. Therefore, the quality of CPR conducted by the bystander was questioned[2]. Basic Life Support (BLS) is fundamental and life-saving following cardiac arrest. It emphasize on high quality CPR as it's associated with improved survival and better outcome[3].

Malaysia Ministry of Health (MOH) recognises the need of health care professionals (HCP) to be trained in CPR when BLS certification among HCP became a Key Performance Indicator (KPI) for Hospital Directors in 2009[4]. Quality of CPR has been found to be inconsistent and

inadequate even in HCP attending in-hospital cardiac arrests. This is due to several reasons, including deterioration of CPR skills over time[5, 6].

To date, there are no major studies comparing CPR skill performance and characteristics among HCP and laypersons in Malaysia. Taking into account demographic variations between the two groups, we explored the differences and factors that affect performance of CPR skills.

## 2. METHODOLOGY

This study was conducted from September 2013 to April 2015. The subjects involved in this study were 144 HCP and laypersons from several nursing institutes, hospitals, universities and companies around Labuan and Kota Kinabalu, Sabah, Malaysia. The age of the respondents ranged from 20 to 55 years old (mean 31.95; SD= 8.752). The respondents group consist of 46.5% male respondents and 49.1%

HCP. 29.8% of the respondents have CPR experience, and 28.9% attended refresher BLS course. Questionnaires used in this study made up from three parts: Part A is on demographic details, time interval since the initial BLS, refresher courses attended, and personal experience with cardiac arrest rescue; Part B is 10 questions of assessment on theoretical CPR knowledge, where each correct answer contributes one point to knowledge scores; and Part C is a checklist adapted from [6] to evaluate the subject's CPR skill performance. This checklist consists of 15 dichotomous skill items describing the procedural elements of CPR performance. All items were coded (0 = not performed, or performed incorrectly; 1 = performed) and summarized to make a checklist performance scale, with a possible range from 1 to 15 points. Each respondent was given a scenario and was asked to perform CPR on a mannequin whilst being evaluated by two qualified instructors.

Reliability of the questionnaires was assessed using Cronbach's alpha. Data collected were analysed with SPSS version 20.0. Standard descriptive statistics were used to summarize the demographics of respondents and CPR performances. Mann-Whitney tests were conducted to compare the average scores for HCP and laypersons, as well as to identify demographic factors which contribute to significant difference in performance score for both groups. Average knowledge scores of both HCP and laypersons group is 7.37 (s.d. = 2.33), while average CPR performance scores is 13.95 (s.d.=1.75).

### 3. RESULT & DISCUSSION

The reliability test result shows high Cronbach's alpha,  $\alpha = 0.906$ , which indicates that the questionnaires used is reliable. Based on the Mann-Whitney test results, BLS knowledge scores are higher for HCP than for laypersons ( $p = 0.014$ ). However, there is no significant difference in the average CPR performance scores. (Table 1).

Comparisons of BLS knowledge scores based on demographic factors for both lay persons and HCP groups are shown in Table 2. Only gender groups show significant difference in BLS knowledge score among HCP, while only time length after first BLS course contributes significant difference in BLS knowledge score among laypersons. Table 3 presents the comparisons of CPR performance scores based on demographic factors for both laypersons and HCP groups.

**Table 1.** Comparison on Mean Scores of BLS knowledge and CPR performance between HCP and laypersons.

BLS knowledge scores			
Category	Median	U	p
Laypersons	7.00	1197.0	0.014
HCP	8.50		
CPR performance scores			
Category	Median	U	p
Laypersons	14.25	1333.5	0.072
HCP	15.00		

**Table 2.** Summary of comparisons of BLS knowledge scores based on demographic factors

	HCP (n=56)		Laypersons (n=58)	
	Median	p	Median	p
Gender		0.026		0.480
Male	8.0		7.0	
Female	9.0		7.0	
CPR Experience		0.880		0.156
Yes	8.0		10.0	
No	9.0		7.0	
Refresher Course		0.622		0.536
Yes	9.0		6.5	
No	8.0		7.0	
Education level		0.150		0.218
High School	5.0		6.0	
Diploma & Degree above	9.0		8.0	
Time length since first BLS Course		0.611		0.006
<3 months	8.0		8.0	
3-6 months	10.0		3.5	
6-12 months	8.5		4.5	
1-3 years	8.5		6.0	
> 3 years	9.0	7.0		

None of the parameters shows significance effect on CPR skill performance among HCP group, while only refresher course contributes significant difference in CPR performance score among laypersons.

### 4. CONCLUSION

Overall, HCP and laypersons groups report comparable skill retention in CPR but HCP shows better BLS knowledge. These early results suggest female HCP has better BLS knowledge compared to male HCP and time length after first BLS course contributes to significant difference in BLS knowledge among laypersons. Laypersons who had attended refresher course have better CPR skill retention compared to those who had not.

**Table 3.** Summary of comparisons of CPR performance scores based on demographic factors

	HCP (n=56)		Laypersons (n=58)	
	Median	p	Median	p
Gender		0.256		0.570
Male	14.75		14.0	
Female	15.0		15.0	
CPR Experience		0.093		0.327
Yes	15.0		15.0	
No	14.5		14.0	
Refresher Course		0.230		0.049
Yes	15.0		15.0	
No	15.0		14.0	
Education level		0.862		0.067
High School	15.0		14.0	
Diploma	15.0		14.0	
Degree & above	15.0		15.0	
Time length since first BLS Course		0.169		0.296
<3 months	14.0		14.5	
3-6 months	15.0		12.75	
6-12 months	15.0		12.75	
1-3 years	14.0		14.0	
> 3 years	15.0		15.0	

The results of this survey will provide valuable insight into factors influencing the BLS knowledge and CPR skill retention after attending training among HCP and laypersons. The findings can then be applied to the design of trials of various interventions designed to improve BLS knowledge and CPR performance. However, the sample size was relatively small and might have prevented reaching statistical significance in several parameters. We believe that a larger study should be conducted.

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## References

- [1] Holmberg M., Holmberg S., Herlitz J. 1999. The problem of out-of-hospital cardiac-arrest prevalence of sudden death in Europe today. *Am J Cardiol* 1999;83: 88D-90D. DOI: 10.1016/S0002-9149(98)01008-X
- [2] American Heart Association Statistics Committee & Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics - 2013 Update: a report from the American Heart Association. *Circulation*. 2013;127.
- [3] Berg, R.A., Hemphill, R., Abella, B.S., Aufderheide, T.P., Cave, D.M., Hazinski, M.F. Part 5: Adult basic life support: 2010 American Heart Association

Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2010;122(suppl 3):S685-S705.

- [4] Sabah Medical Division. Performance Indicator Hospital Director No.7: Percentage of clinical personnel or paramedics in acute care areas who have current trained status in BLS in a year. Sabah State Health Department; 2013.
- [5] Abella, B.S., Alvarado, J.P., Myklebust, H., Edelson, D.P., Barry, A., O'Hearn, N. Quality of cardiopulmonary resuscitation during in-hospital cardiac arrest. *J Am Med Assoc*. 2005;293(3): 305-10. DOI: 10.1001/jama.293.3.305
- [6] Li, H.F, Wang, T.L., Kao, Y.H. Evaluation of skills in cardiopulmonary resuscitation – what is the initial behaviour of 1st grade senior high school students? *Ann Disaster Med*. 2006;4(2): 37-43.
- [7] Brennan, R.T., Braslow, A., Batcheller, A.M., Kaye, W. A reliable and valid method for evaluating cardiopulmonary resuscitation training outcomes. *Resuscitation*. 1996;32(2): 85-93. DOI: 10.1016/0300-9572(96)00967-7