Original article

General population's eagerness and knowledge regarding basic life support: A community based study in Jakarta, Indonesia

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ABSTRACT

Background: Basic life support (BLS) performed by general population improves outcomes in cardiorespiratory collapse. This community-based study aims to measure the general population's eagerness in learning BLS, knowledge regarding early recognition, and use an automated external defibrillator.

Methods: This was a cross-sectional community-based study in Jakarta using questionnaire. Numerous questions asked through a questionnaire in order to evaluate the general population's eagerness and knowledge about basic life support.

Results: There were 303 respondents in this study. Most respondents stated that knowledge about BLS is important and was eager to learn; however, only 39.6% of respondents have ever done BLS training. 59.4% of respondents have ever looked for information or read about BLS. 63.6% of respondents chose to call an ambulance for the first reaction, while 36.5% of respondents preferred to look for a pulse. Most of the respondents know to check the carotid pulse in the neck. 77.4% of respondents know that chest compression was done on mid-chest. 81.5% of respondents agreed that CPR was preferably done repeatedly in a specific rhythm, but giving one despite the method is better than none. Only 49.5% of respondents wanted to give mouth-to-mouth ventilation. Most respondents thought that they are not allowed to use AED, and only a small proportion had seen AED in public.

Conclusion: Most of the respondents agreed that BLS is important. Respondents have satisfying knowledge about how to react while encountering an unconscious person. Most respondents have not seen AED and most likely didn't know how to use it.

1. Background

Basic life support (BLS) performed by general population improves outcomes in cardiorespiratory collapse, yet less than 1% of the general population can perform it effectively.¹ Each year, more than 350,000 individuals in North America and 300,000 individuals in Europe suffer from out-of-hospital cardiac arrest.² As time passes, the number of patients with a shockable rhythm decreases, and as a result, the chance of survival diminishes with 7–10% for every minute that passes without intervention.³ Emergency management includes cardiopulmonary resuscitation (CPR) and the use of an automated external defibrillator (AED). When both of these performed, the survival rate is 75% higher than CPR alone.⁴ This community-based study aims to measure the

general population's eagerness in learning BLS, knowledge regarding early recognition, and use an automated external defibrillator. To the best of our knowledge, this is the first study that assessed the eagerness and knowledge of basic life support in Indonesia.

2. Methods

2.1. Study design

This was a cross-sectional study conducted in June 2016. For this study, we used a questionnaire that was distributed to potential participants through simple random sampling. The questionnaire was given randomly to non-medical personnel in public places across North

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Jakarta, West Jakarta, Central Jakarta, East Jakarta, and South Jakarta. We included respondents that gave their consent to fill the questionnaire and has an age of > 17 years old. We excluded potential respondents that were from a medical background (medical doctors, allied professional, paramedics, and midwives). We collected 61 respondents from North Jakarta, 60 from West Jakarta, 61 from Central Jakarta, 60 from East Jakarta, and 61 from South Jakarta.

2.2. The questionnaire

There were numerous questions asked through a questionnaire in order to evaluate the general population's eagerness and knowledge about basic life support. The questions were in Indonesian Language and were designed as multiple choice questions. This was a three-segment questionnaire. The first segment evaluated the characteristics of the respondents and their opinion on BLS; which includes a question on whether they thought that BLS is important, whether they are eager to learn, their experience in BLS training, and have they ever looked up for information on BLS. The second segment assesses the basic knowledge if BLS; this segment contains questions on what will they respond with should they find someone with probable cardiac arrest, location to check for a pulse, site for chest compression, their methods, their opinion on mouth-to-mouth ventilation. The third segment consists of questions directed at the knowledge of AED; this includes the place they have ever seen an AED (if any) and their stance on the use of AED by non-medical personnel.

2.3. Statistical analysis

All statistical analysis was performed using IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp) and Microsoft Excel software. Description of the sample was performed using descriptive statistics option in the SPSS; most of the data in this study is presented as [number (%)].

3. Results

We approached 350 people and asked for consent to fill our questionnaire, and there were 303 respondents (160 males, and 143 females) that consented to fill the questionnaire. Majority of respondents' level of education was high school (58%) and undergraduate (38%). Most of the respondents were 17–30 years old (63.7%) (Table 1). Among the participants, there were 294 (97%) respondents that thought knowledge on BLS is important, and 222 (73.5%) respondents were eager to learn about BLS. Despite a high number of those who were eager to learn, only 120 (38.6%) of respondents have ever participated in BLS training. 180 (59.4%) respondents have ever looked for information on BLS. 192 (63.6%) respondents chose to call an ambulance for the first reaction while 111 (36.4%) respondents preferred to look for a pulse. 284 (93.7%) respondents chose to check carotid pulse, and other 19 (6.3%) respondents chose to look for pulse elsewhere. 233 (77.4%) respondents know that chest compression was done on mid-chest. 246 (81.5%) respondents agreed that CPR was preferably done

Table 1
Baseline characteristics of the respondents participating in the survey.

Baseline Characteristics		Percentage (%)
Gender	Male	52.8
	Female	47.2
Age	17–30	63.7
	30–40	29.7
	> 40	9.9
Level of Education	High School	58
	Undergraduate	38
	Others (Junior high, postgraduate)	4

Table 2

Subjects response to items in the questionnaire.

Items	Yes/Correct Answer (%)	No/Incorrect Answer (%)
General Population's Eagerness in Learning Basic Life Support		
BLS is important	97	3
Eager to Learn	73.5	26.5
Ever done BLS training	61.4	38.6
Ever looked for information or read about BLS	59.4	40.6
General Population's Early Response to Cardiac Arrest		
Method of pulse checking	93.7	6.3
Chest compression site	77.4	22.6
Preferably done repeatedly in a specific rhythm, but better than none	81.5	18.5
Willing to give mouth-to-mouth ventilation when needed	49.5	50.5
General Population's Knowledge about AED		
Everyone can use an AED	34.7	65.3
Should be used indiscriminately on every unconscious person, suspected of having a cardiac arrest	37.3	62.7
Have seen AED in Public Places	17.2	82.8

Description: AED = Automated External Defibrillator; BLS = Basic Life Support.

repeatedly in a specific rhythm, but giving one despite the method is better than none while 57 (18.5%) disagreed. Only 150 (49.5%) respondents willing to give mouth-to-mouth ventilation if needed. 198 (65.3%) respondents answered 'only paramedics are allowed to use AED' while 105 (34.7%) of them think otherwise. 251 (82.8%) respondents have never seen AED in public, only 53 (17.2%) of them have seen AED at the hospital (33 respondents/62.3%), airport, and mall. 190 (62.7%) respondents disagreed that AED should be used indiscriminately on every unconscious person suspected of having a cardiac arrest (Table 2).

4. Discussions

Majority of respondents (97%) wanted to know BLS better, and more than half of them (73.5%) wanted to learn about it which were satisfying. Most of the respondents correctly answer that pulse can be examined by palpating carotid pulse. Correct method of pulse examination may avoid unnecessary CPR in non-cardiac arrest and unnecessary delay CPR in true cardiac arrest. 77.4% know that CPR is performed on mid-chest, which is also satisfying. A high-quality CPR is critical, an insufficient depth and pace of compression can reduce survival by 30% respectively.^{5–7} While this questionnaire is unable to determine the quality of CPR performed by the respondents, knowing the correct method is an essential first-step in BLS. Only 49.5% wanted to perform mouth-to-mouth ventilation; however, this is not a concern because according to L. Cabrini et al., a bystander compression-only CPR should be recommended as the preferred CPR technique performed by untrained bystander hence early recognition and willingness to initiate CPR is more important than a delaying CPR to finding someone who is willing to perform mouth-to-mouth ventilation.⁸ This should be known to the public, which will increase their willingness and shorter period of arrest to the first response. 65.3% didn't know that everyone can use AED, which is a major concern because we need to rely on a bystander to initiate. 62.7% think AED should not be used in those unconscious person suspected to be in cardiac arrest, while it is true that electrical shocks are not always needed in those, AED should be attached to detect. 82.8% have never seen AED and the majority of those who see only in hospitals these reflect either poor availability of AED in public places or people are not aware of its presence. We would like to highlight that only small proportion of people thought that they can use AED and in real-life situation, these people might not be able to find AED due it's to poor availability. Should the bystanders are able to find AED, it is yet to be known whether they can operate the machine correctly (only a small percentage has done BLS training), whereas

early defibrillation by AED is the most critical intervention for out-of-hospital cardiac arrest which survival proportions > 50% if done. According to Bækgaard et al. defibrillation by non-dispatched lay first responders had the highest impact on survival (almost two-fold) compared to EMDC-dispatched professional first responders.³ Hence, poor knowledge regarding the use of AED is one of the major issues that may affect the survival of out-of-hospital cardiac arrest.

5. Conclusions

Most of the respondents agreed that BLS is important and are eager to learn about it. Respondents have satisfying knowledge about how to react while encountering an unconscious person; this, however, does not directly translate to fluency in a real-life situation. Most of the respondents think that they are not allowed to use AED and only a minority of them had seen AED in public, and most of them are in hospitals meaning that AED is limited in public places. Mass media and public figure should take part in encouraging people to learn about basic life support.

6. Strengths and limitations of the study

The strength of our study is that this paper is, to the best of our knowledge, the first to describe the general awareness of BLS in Indonesia. Hence, this is the first article to provide insight on BLS among the general population in Indonesia. We also took the samples throughout different regions of Jakarta to minimize bias of taking the samples from a specific place. The limitation of our study is that the sample is small compared to the size of the population in Jakarta. This study did not include other parts of Indonesia. It should be noted that Jakarta is currently (at the time this paper was written), capital and the largest city in Indonesia, hence, did not reflect the knowledge across the nation. This questionnaire relies on the honesty of respondents on answering these questions. Answering the questionnaire correctly does not reflect fluency in a real-life situation.

Declaration of competing interest

The authors declare that they have no competing interests.

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Abbreviations

AED	Automated External Defibrillator
BLS	Basic Life Support
CPR	Cardiopulmonary Resuscitation

Declarations

Ethics approval and consent to participate

Not Applicable.

Consent for publication

Not Applicable.

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References

1. Connolly M, Toner P, Connolly D, McCluskey DR. The 'ABC for life' programme—teaching basic life support in schools. *Resuscitation*. 2007;72(2):270–279. <https://doi.org/10.1016/j.resuscitation.2006.06.031>.
2. Atwood C, Eisenberg MS, Herlitz J, Rea TD. Incidence of EMS-treated out-of-hospital cardiac arrest in Europe. *Resuscitation*. 2005;67(1):75–80. <https://doi.org/10.1016/j.resuscitation.2005.03.021>.
3. Bækgaard JS, Viereck S, Møller TP, Ersbøll AK, Lippert F, Folke F. The effects of public access defibrillation on survival after out-of-hospital cardiac arrest. *Circulation*. 2017;136(10):954–965. <https://doi.org/10.1161/CIRCULATIONAHA.117.029067>.
4. Mozaffarian D, Benjamin EJ, Go AS, et al. Heart disease and stroke statistics—2016 update. *Circulation*. 2016;133(4) <https://doi.org/10.1161/CIR.0000000000000350>.
5. Meaney PA, Bobrow BJ, Mancini ME, et al. Cardiopulmonary resuscitation quality: improving cardiac resuscitation outcomes both inside and outside the hospital. *Circulation*. 2013;128(4):417–435. <https://doi.org/10.1161/CIR.0b013e31829d8654>.
6. Abella BS, Sandbo N, Vassilatos P, et al. Chest compression rates during cardiopulmonary resuscitation are suboptimal. *Circulation*. 2005;111(4):428–434. <https://doi.org/10.1161/01.CIR.0000153811.84257.59>.
7. Stiell IG, Brown SP, Christenson J, et al. What is the role of chest compression depth during out-of-hospital cardiac arrest resuscitation?*. *Crit Care Med*. 2012;40(4):1192–1198. <https://doi.org/10.1097/CCM.0b013e31823bc8bb>.
8. Cabrini L, Biondi-Zoccai G, Landoni G, et al. Bystander-initiated chest compression-only CPR is better than standard CPR in out-of-hospital cardiac arrest. *HSR Proc Intensive Care Cardiovasc Anesth*. 2010;2(4):279–285 <http://www.ncbi.nlm.nih.gov/pubmed/23439400>.