Original article:

The effect of “Mosque Lifesaver Training” on lay persons’ knowledge and willingness to perform basic life support in Indonesia  
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Abstract:  
Background: Cardiac arrest mostly happens in out hospital setting. Bystander CPR improves survival after out-of-hospital cardiac arrest. In 2018 BSMI Jakarta Raya started the Mosque lifesaver training as basic life support training for laypersons in Indonesia, optimizing mosques as the center of community activities. The aim of this study is to evaluate the effect of “mosque lifesaver training” for the laypersons’ knowledge and willingness to perform basic life support. Methods: There are 247 people from twelve mosques that participated in this research. The participants were given fifteen multiple-choice pre-posttest questioners in basic life support knowledge, one full day two-direction training, one-by-one practicing in small group for adult and pediatric CPR (Cardio-Pulmonary Resuscitation), and CPR skill test. Data was collected and statistically analyzed with SPSS 24 Software by IBM. Results and discussion: From 247 participants, 32 were excluded due to lack of data. For rest of 215 participants, 32.1% was housewife, mean value of age was 39.1 ± 0.9 SD years, educational background was bachelor in 44.7% participants. Mean value of pre-test and post-test were 28.70 ± 16.8 SD and 55.73 ± 19.30 SD, respectively. The post-test result has significant correlation of profession (p=0.003), but no significant correlation of age (p=0.08) and educational background (0.51). Marginal homogeneity test for pre and post test data brought p<0.001 significance. Before the training, only 57.2% participants had willingness to perform cardiopulmonary resuscitation. After the training, 91.2% participants have willingness to perform cardiopulmonary resuscitation if witness sudden cardiac arrest of unknown people. Conclusion: Participants who enrolled the training were predominantly by housewife, productive age with bachelor educational background. Mosque lifesaver training show significant improvement in laypersons’ knowledge and willingness to perform basic life support.  
Keywords: basic life support, layperson, mosque, training, Indonesia

Background  
Cardiac arrest mostly happens in out hospital setting. For out-of-hospital cardiac arrest victims, the key determinants of survival are the timely performance of bystander cardiopulmonary resuscitation (CPR) and defibrillation for those in ventricular fibrillation or pulseless ventricular tachycardia. Only a minority of cardiac arrest victims receive potentially lifesaving bystander CPR, thus indicating room for improvement from a systems and educational point of view. Without immediate initiation of CPR, most

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victims of cardiac arrest will die. Bystander CPR can significantly improve survival rates from cardiac arrest, but evidence indicates that only 15% to 30% of victims of outhospital arrest receive CPR before Emergency Medical System (EMS) arrival.\(^2\,^3\)

Commonly cited reasons for reluctance to perform lifesaving maneuvers include concern for injuring the victim,\(^4\,^6\) fear of performing CPR incorrectly,\(^2\,^7\,^10\) physical limitations, fear of liability,\(^11\) fear of infection,\(^9\) or victim characteristics.\(^12\,^13\) Opportunities exist to overcome many of these barriers through education and encouragement to perform when the bystander is faced with a victim in cardiac arrest.\(^1\)

Defining the optimal means of delivering resuscitation education to address these critical determinants of survival may help to improve outcomes from cardiac arrest. Although the factors influencing willingness to perform CPR are myriad, many obstacles can be overcome with education. Although the precise number of trained volunteers needed to optimize the chance that a specific victim will receive CPR is not known, it is reasonable to assume that maximizing the number of people trained in a community and providing instructions and encouragement at the time an event occurs will improve the odds that a bystander will engage in resuscitation efforts.\(^1\)

Individuals with CPR training are more likely to deliver the lifesaving intervention to cardiac arrest victims. Furthermore, those with training perform higher quality CPR to victims of cardiac arrest and increase survival rates.\(^2\)

Indonesia has the largest Muslim population in the world. In Islam, A Mosque or masjid is not only a place to worship god, but also the center of community. To maximizing the number of people with CPR training in a community, in 2018 BSMI Jakarta Raya started the Mosque Lifesaver training as basic life support training for laypersons\(^5\) in Indonesia. The aim of this study is to evaluate the effect of “mosque lifesaver training” for the laypersons’ knowledge and willingness to perform basic life support.

Methods
BSMI Jakarta Raya collaborated with mosque organizer conducted one day Mosque Lifesaver Training for the participants of twelve mosque in Indonesia. The training consisted of two sections which were lecture section and practical section. The training was one day and two direction training. The lecture and practical section basically taught about the CPR (Cardiopulmonary Resuscitation) for adult and pediatric. For the practical section, every participant in small group tried to practice the CPR technique based on the checklist. The trainer was a doctor who has passed from training for trainer which was conducted by BSMI. The training curriculum was based on the ‘2015 AHA Guidelines of Basic Life Support’ in every training, there were pre-test and post-test for lecture section and skill-test for practical section. The pre-test and post-test for lecture section were consisted of fifteen same multiple-choice question. The skill test for practical section was examined based on the checklist for each skill. At the end of the training, there were participant who were pass and failed based on the score in post-test and skill test.Cross-sectional survey was conducted based on the pre-test, post-test, and questionnaire for every participant. Demographic data which collected before the training was provided. The training participants were chosen by local mosque organizer. The total participants were 247 laypersons.

Statistical Analysis
The data was statistically analyzed using SPSS 24 Software by IBM. Marginal homogeneity, person chi square, and fisher, and Mc Nemar test was used for data analysis. Statistics are called significant if the \(p\) value is less than 0.05.

Results
As amount of 247 participants during 2018 were trained and unfortunately 32 of them could not be evaluated due to lack of data and for the rest of 215 participants could be figured in Table 1. Most of participants were in productive age. Participant were form several profession and education background. The table shows there was participants who only graduate from elementary. Almost all participants had never trained about Basic Life Support (BLS) before (97.7%)
Table 1. Demographic characteristics of mosque lifesaver training

| Characteristics               | n total = 215 n (%), M ± SD |
|------------------------------|------------------------------|
| Age                         | 39.1 ± 0.9                   |
| Profession                   |                              |
| Housewife                   | 69 (32.1)                    |
| Employee                    | 37 (17.2)                    |
| Students                    | 42 (19.5)                    |
| Entrepreneur                | 23 (10.7)                    |
| Teacher                     | 35 (16.3)                    |
| Mosque Employee             | 3 (1.4)                      |
| Retired                     | 6 (2.8)                      |
| Education                   |                              |
| Elementary                  | 2 (0.9)                      |
| Junior High School          | 12 (15.6)                    |
| Senior High School          | 24 (11.2)                    |
| Diploma                     | 71 (33)                      |
| Bachelor                    | 96 (44.7)                    |
| Master                      | 10 (4.7)                     |
| Previous BLS Training       |                              |
| Yes                         | 5 (2.3)                      |
| No                          | 210 (97.7)                   |

The laypersons’ knowledge before and after mosque lifesaver training was assessed by pre-test and post-test. Level of knowledge divided by the test score into 3 categories which are low (0-50), moderate (51-80), and high (81-100). The relationship of mosque lifesaver training on laypersons’ knowledge shows in Table 3. Most of the participants knowledge before the training was low (89.9%) and no participants had high knowledge level before the training. The number of participants who had high knowledge level increased to 15 participants (7%) after the training. Marginal Homogeneity test showed the relationship of the knowledge level and mosque lifesaver training ($p < .000$).

Table 2. Effect of mosque lifesaver training on laypersons’ knowledge

| Post-training knowledge | Total | p |
|-------------------------|-------|---|
| High                    | 117   |   |
| Moderate                | 6     |   |
| Low                     | 92    |   |

Table 3. Relationship of demographic characteristic and laypersons’ knowledge before and after training

| Characteristics | Before training | After Training |
|-----------------|-----------------|---------------|
| Age             | 0.22            | 0.08          |
| Profession      | 0.65            | 0.003         |
| Education       | 0.87            | 0.51          |
| Previous BLS Training | 0.42      | 0.163         |

The willingness to perform basic life support assessed by questionnaire. The relationship of the training on willingness to perform basic life support shows on Table 4. Before training, there were 92 participants who didn’t want to perform basic life support. After training, the number lowered to 19 participants who didn’t want to perform basic life support. Mc Nemar test shows the relationship of the training and willingness to perform basic life support ($p < .000$).

Table 4. Effect of Mosque Lifesaver Training on laypersons’ willingness to perform basic life support

| Willingness to Perform BLS after training | Total | p |
|------------------------------------------|-------|---|
| Yes                                      | 117   | 6|
| No                                       | 79    | 13|

Most of the reasons why participants didn’t want to perform BLS before training was lack of knowledge (Table 5). Some of them was panic, worry about infection, lack of confidence, worry to be sued and blamed, and didn’t want to perform BLS to another gender. After the training, most of the participants reason was the fear of contagious infection. Some of the reasons were lack of confidence, fear to be blamed if the victim getting worse, and the body posture.

Table 5. Reasons the laypersons’ refuse to perform BLS before and after training

| Reasons                  | Before training | After Training |
|--------------------------|-----------------|----------------|
| Panic                    | 10              | 0              |
| Gender difference        | 2               | 0              |
| Lack of knowledge        | 53              | 0              |
| Risk of contagious infection | 15           | 8              |
| Lack of confidence       | 1               | 6              |
| Fear to be blamed        | 11              | 2              |
| Posture                  | 0               | 1              |

Effect of demographic analysis on pre- and post-training knowledge shows in Table 3. The are no effect of demographic characteristics (age, profession, education, and previous BLS training) on pre-training knowledge ($p > 0.05$). Meanwhile, profession background has effect on post-training knowledge ($p = 0.003$). Although, the others demographic characteristics (age, education, and previous BLS training) have no effect on post-training knowledge.
Discussion and Conclusion
Demographic characteristics show despite having various educational experience, previous training and age, single-day basic life support training has significant impact in improving knowledge in lay rescuers in Indonesia. Therefore, this single-day basic life support training method provides an opportunity to be developed as a standard teaching method to be applied in Indonesia.
Identifying and exploring learners’ barriers to helping can be useful to instill confidence and develop helping strategies to use in the future. Most of the reasons why participants didn’t want to perform BLS before training was lack of knowledge. Some of them was panic, worry about infection, lack of confidence, worry to be sued and blamed, and didn’t want to perform BLS to another gender. Because panic can significantly impair a bystander’s ability to perform in an emergency, it may be reasonable for CPR training to address the possibility of panic and encourage learners to consider how they will overcome it. After the training, most of the participants reason was the fear of contagious infection. Some of the reasons were lack of confidence, fear to be blamed if the victim getting worse, and the body posture.
Fear of harming the victim or fear of personal harm (i.e. infection or injury) may reduce willingness to undertake basic life support training or to perform CPR. However, infection resulting from CPR performance is extremely rare and limited to a few case reports. Despite the low risk of infections, it is reasonable to teach rescuers about the use of barrier devices emphasizing that CPR should not be delayed for their use. Rescuers who are not willing to perform mouth-to-mouth ventilations may be willing to perform Hands-Only (chest compression-only) CPR. Educating the public about the low risks to the rescuer and victim may increase willingness to perform CPR. The number of participants who didn’t want to perform basic life support decreases significantly after the training. Actual bystanders and surveys of the general public report that people more recently trained in CPR techniques expressed greater willingness to attempt resuscitation than those without recent training. Organized community programs that prepare the lay public to provide bystander CPR and early defibrillation offer the best opportunity for successful resuscitation in the initial minutes after OHCA and represent the community link in the OHCA Chain of Survival. CPR training as organized community programs (e.g. in mosques) is important to increase knowledge to perform CPR, thus increase the survival of cardiac arrest victims.
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Conflict of Interest
All authors confirmed that there is no conflict of interest for this publication.
Author’s Contribution
Idea owner of this study: AJ
Study design: NN, SA
Data gathering: RN, DS
Writing and submitting manuscript: NN, RN, SA
Editing and approval of final draft: AJ, NN
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1. Bhanji F, Donoghue AJ, Wolff MS, Flores GE, Halamek LP, Berman JM, Sinz EH, Cheng A. Part 14: education: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2015 Nov;132(18):561-73.

2. American Heart Association. Facts. A race against the clock: out-of-hospital cardiac arrest [Internet]. Available from: http://www.heart.org/idc/groups/heart-public/@wcm/@adv/documents/downloadable/ucm_461797.pdf [2014 Mar; cited 2018 Dec 27]

3. Sasson C, Rogers MA, Dahl J, Kellermann AL. Predictors of survival from out-of-hospital cardiac arrest: a systematic review and metaanalysis. Circ Cardiovasc Qual Outcomes. 2010 Jan;3(1):63–81.

4. Abella BS, Aufderheide TP, Eigel B, Hickey RW, Longstreth WT Jr, Nadkarni V, Nichol G, Sayre MR, Sommargren CE, Hazinski MF. Reducing barriers for implementation of bystander-initiated cardiopulmonary resuscitation: a scientific statement from the American Heart Association for healthcare providers, policymakers, and community leaders regarding the effectiveness of cardiopulmonary resuscitation. Circulation. 2008 Feb;117(5):704–9.

5. Hubble MW, Bachman M, Price R, Martin N, Huie D. Willingness of high school students to perform cardiopulmonary resuscitation and automated external defibrillation. PrehospEmerg Care. 2003 Apr;7(2):219–24.

6. Swor R, Khan I, Domeier R, Honeycutt L, Chu K, Compton S. CPR training and CPR performance: do CPR-trained bystanders perform CPR? AcadEmerg Med. 2005 Dec;13(6):596–601.

7. Moser DK, Dracup K, Doering LV. Effect of cardiopulmonary resuscitation training for parents of high-risk neonates on perceived anxiety, control, and burden. Heart Lung. 1999 Sept;28(5):326–33.

8. Omi W, Taniguchi T, Kaburaki T, Okajima M, Takamura M, Noda T, Ohta K, Itoh H, Goto Y, Kaneko S, Inaba H. The attitudes of Japanese high school students toward cardiopulmonary resuscitation. Resuscitation. 2008 Sept;78(3):340–45.

9. Shibata K, Taniguchi T, Yoshida M, Yamamoto K. Obstacles to bystander cardiopulmonary resuscitation in Japan. Resuscitation. 2000 May;44(3):187–93.

10. Taniguchi T, Omi W, Inaba H. Attitudes toward the performance of bystander cardiopulmonary resuscitation in Japan. Resuscitation. 2007 Oct;75(1):82–7.

11. Dwyer T. Psychological factors inhibit family members’ confidence to initiate CPR. PrehospEmerg Care. 2008;12(2):157–61.

12. Coons SJ, Guy MC. Performing bystander CPR for sudden cardiac arrest: behavioral intentions among the general adult population in Arizona. Resuscitation. 2009 Mar;80(3):334–40.

13. Caves ND, Irwin MG. Attitudes to basic life support among medical students following the 2003 SARS outbreak in Hong Kong. Resuscitation. 2006 Jan;68(1):93–100.

14. Johnston TC, Clark MJ, Dingle GA, FitzGerald G. Factors influencing Queenslanders’ willingness to perform bystander cardiopulmonary resuscitation. Resuscitation. 2003 Jan;56(1):67–75.

15. Boucek CD, Phrampus P, Lutz J, Dongilli T, Bircher NG. Willingness to perform mouth-to-mouth ventilation by health care providers: a survey. Resuscitation. 2009 June;80(8):849–53.

16. International Federation of Red Cross and Red Crescent Societies. International first aid and resuscitation guidelines [Internet]. Available from: https://www.ifrc.org/Global/Publications/Health/First-Aid-2016-Guidelines_EN.pdf [2016 Jan; Cited 2018 Dec 27]

17. Kuramoto N, Morimoto T, Kubota Y, Maeda Y, Seki S, Takada K, Hiraide A. Public perception of and willingness to perform bystander CPR in Japan. Resuscitation. 2008 Dec;79(3):475–81.

18. Kronick SL, Kurz MC, Lin S, Edelson D P, Berg R A, Billi JE, et al. Part 4: systems of care and continuous quality improvement American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation. 2015 Nov;132(18):397-413.