

The impact of basic life support training on the knowledge and skills amongst medical students in faculty of medicine, Universitas Malikussaleh: a pre-experimental study

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ABSTRACT

Introduction: Basic life Support (BLS) is a series of initial attempts to restore respiratory and/or circulatory functions in a person whose breathing and/or circulation stopped (cardiac or respiratory arrest). This study aimed to determine the impact of Basic Life Support (BLS) Training on the knowledge and skills amongst medical students of the Faculty of Medicine, Universitas Malikussaleh.

Methods: An institution-based pre-experimental study with no control of extraneous variables in the form of a one-group pre-test-post-test design. Three steps of the study, administering a pre-test measuring the dependent variables, applying the training to the respondents, and administering a post-test. The differences attributed to the application of the BLS training were then evaluated by comparing the pre-test and post-test scores using the Wilcoxon test, and the differences were considered significant at $p < 0.05$.

Results: A total of 82 medical students were involved in this study. The overall knowledge of BLS before the training was categorized as good, adequate, and poor with 1 (1.2%), 57 (69.5%) and 24 (29.3%), respectively. While the level of BLS skills of all respondents, 82 (100%), was poor. However, the level of knowledge and skills amongst respondents after participating in BLS training categorized as adequate increased significantly to 77 (93.9%) and 48 (58.5%), respectively, and none of the respondents categorized as a poor level of knowledge even though there were 34 (41.5%) respondents still had poor level of skills. Bivariate statistical analysis using the Wilcoxon test found that the BLS training impacts knowledge and skills with a p -value of 0.000 ($p < 0.05$).

Conclusion: This study showed that the implementation of BLS training for medical students greatly impacts knowledge and skills. The routine non-academic BLS training should be considered to increase both knowledge and skills amongst medical students.

Keywords: Basic Life Support Training, Knowledge, Skills.

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INTRODUCTION

Cardiac arrest is a sudden loss of cardiac function within patients either or not previously diagnosed with cardiac diseases. Sudden death due to cardiac attacks is the major public health problem worldwide.¹ Cardiac arrest in general is categorized in Out of Hospital Cardiac Arrest (OHCA) and In-Hospital Cardiac Arrest (IHCA). OHCA is an event that occurs out of the hospital setting vice versa IHCA is taking place within the hospital. Due to its prevalence of between 50 and 60

cases per 100,000 people/year, OHCA has become the main public health concern globally. The United States of America and Europe have the higher number of OCHA with 420,000 and 300,000 cases annually. The number of OHCA in Indonesia is predicted to reach 10,000 cases per year, or roughly 30 OHCA occurs every day.²

Basic Life Support (BLS) is a series of initial attempts to restore respiratory and/or circulatory functions in a person whose breathing and/or circulation stopped (cardiac or respiratory arrest).³ A proper knowledge and skill of BLS are very

important because the sudden cardiac death in emergency phases is due to the incompetence of helpers in handling patients during the golden period. One of the attributed factors regarding this issue is a lack of knowledge and skill facing emergencies due to cardiac and/or respiratory arrest.⁴ Ideally, the knowledge of BLS should be mastered by all societies, especially medical practitioners.⁵ This is because basic life support is a competency that must be mastered by medical personnel, including those who are still in the educational stage, namely medical

students. This study aimed to determine the impact of Basic Life Support (BLS) Training on the knowledge and skills amongst medical students of the Faculty of Medicine, Universitas Malikussaleh.

METHODS

An institution-based pre-experimental study with no control of extraneous variables in the form of a one-group pre-test-post-test design was conducted from November 2019 to March 2020. A total of 82 medical students of the Faculty of Medicine Universitas Malikussaleh who have met the inclusion and exclusion criteria were involved in this study. Medical students of Faculty of Medicine Universitas Malikussaleh (entrance within 2019) who have never attended the BLS training and agreed to involve in the study were the inclusion criteria; conversely, the students who were absent during the study or incomplete the study protocol was excluded. A validated and self-explanatory questionnaire comprising of 18 questions was adopted to evaluate the knowledge of BLS.⁶ Objective Structured Clinical Examination (OSCE) assessment rubric was used to assess the participants' skills of BLS. The questionnaire comprised of five main areas: (1) The definition of BLS, (2) the purpose of BLS, (3) the indication of performing BLS, (4) the BLS principle, (5) the step in performing BLS. The questionnaire was prepared in Bahasa Indonesia as the national and mother language of all participants.

The protocol of the study was presented to the Institutional Ethics Committee, and Ethical Approval was obtained. The importance of the study was explained verbally to the participants, and written informed consent was obtained before fulfill the questionnaire. All participants underwent a three-step study, fulfilling a pre-test measuring the dependent variables, participating in the BLS training, and completing a post-test measuring the dependent variables. The data were analyzed using the Statistical Package for Social Sciences (SPSS). The differences attributed to the application of the BLS training were then evaluated by comparing the pre-test and post-test scores using the Wilcoxon test, and the differences were considered significant at $p < 0.05$.

Table 1. Characteristics of respondents

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	18	21.9
Female	64	78.1
Age (y.o)		
19	50	60.97
20	27	32.92
21	5	6.09

Table 2. The frequency distribution of respondent knowledge before and after the intervention (Attending BLS training)

Knowledge	Before BLS Training	After BLS Training
Good	1 (1.2%)	77 (93.9%)
Adequate	57 (69.5%)	5 (6.1%)
Poor	24 (29.3%)	0 (0%)
Total	82 (100%)	82 (100%)

Table 3. The frequency distribution of respondent skills before and after the intervention (Attending BLS training)

Skills	Before BLS Training	After BLS Training
Good	0 (0%)	48 (58.5%)
Poor	82 (100%)	34 (41.5%)
Total	82 (100%)	82 (100%)

Table 4. Wilcoxon test for the level of knowledge before and after intervention (BLS Training)

Level of knowledge	N	Sum of Ranks	Asymp. Sig (2-tailed)
After BLS Training	Negative ranks	0	0.000
Before BLS Training	Positive ranks	78	
	ties	4	
	Total	82	

Table 5. Wilcoxon test for the level of skills before and after intervention (BLS Training)

Level of Skill	N	Sum of Ranks	Asymp. Sig. (2-tailed)
After BLS Training	Negative ranks	0	0.000
Before BLS Training	Positive ranks	48	
	ties	34	
	Total	82	

RESULTS

A total of 82 medical students were involved in this study. Female respondents were 3 times higher than male respondents with 64 (78.1%) compared to 18 (21.9%) and the youngest participants was 19 years old (60.97%) and the oldest was 21 years old (6.09%), while the rest was 20 years old (32.92%) (Table 1).

Among those before underwent the intervention (attending BLS training), only one participant who has a good level of BLS knowledge while the rest stood at the adequate and poor level of BLS knowledge with 57 (69.5%) and 24 (29.3%), respectively (Table 2). The significant increase of BLS knowledge within-participant occurred after all participants received BLS training. More

than 90% of participants stood at a good level of knowledge after involving in BLS training, and surprisingly, there was no participant left in the poor level of knowledge (Table 2).

Regarding BLS skills, all participants (100%) had poor skills before undergoing the BLS training. This figure changed significantly after the participants receiving BLS training. Almost 60% of those participants reach a good level of BLS skill (Table 3).

Table 4 describes the result of the Wilcoxon test regarding the impact of BLS training on knowledge changing amongst all participants. The zero negative ranks value indicates no decrease in the participants' scores between pre-test and post-test, while the positive ranks increased significantly within 78 participants. It can be concluded that the BLS training positively affected the respondents during the study.

A similar trend was also found in terms of BLS skills amongst study participants (Table 5). Even though the positive ranks had a lower number than the positive ranks in the knowledge section with 48 respondents and 78 respondents, the negative ranks remained zero. However, the ties indicating no change in the value between pre and post-test were considerably high with 34 respondents. As the significant value (p-value) resulted from the Wilcoxon test was 0.000, it concluded that the BLS training positively impacts both knowledge and skills of study participants.

DISCUSSION

The overall knowledge of BLS before the training was categorized as good, adequate, and poor with 1 (1.2%), 57 (69.5%) and 24 (29.3%), respectively. Almost one-third of participants stood at a poor level of BLS knowledge. The absence of BLS training in high school curricula is believed to be the main reason, especially in Indonesia. Some other studies showed a similar result regarding the level of BLS knowledge. Abdillah (2019) found that about 66.2% of respondents stood on the poor level of BLS knowledge before participating in the BLS training.⁷ The similar result also obtained by Sudarman (2019) on evaluating the level of BLS knowledge among senior high

school students in South Sulawesi with 66.7% participants had an inadequate level of BLS knowledge.⁸

Besides having no basic information and receiving no routine BLS training from the related agencies, the equipment for BLS training was not available such as the Cardio-Pulmonary Resuscitation kit. For these reasons, unsurprisingly, the BLS skills among all participants (100%) in this study were poor. Those skills are the ability to perform the checking the response, inspect the thorax movement, palpating carotid artery, determining the position of chest compression, adequate compression, and positioning the patients after the return of spontaneous circulation. The skill development can be carried out after involving in learning activities.⁹ Receiving accurate information and involving in proper training play an important role in enhancing certain skills.⁷

Nevertheless, respondents' level of knowledge and skills after participating in BLS training categorized as adequate increased significantly to 77 (93.9%) and 48 (58.5%). These phenomena were mostly influenced by the high enthusiasm of all respondents who underwent the intervention (BLS training). A mix-method (theory and practice) used in delivering the training also has an important role in increasing the participants' understanding.¹⁰ Bivariate statistical analysis using the Wilcoxon test found that the BLS training impacts knowledge and skills with a p-value of 0.000 ($p < 0.05$). It means that the null hypotheses were rejected. This also implies that undergo BLS training using the affective method will increase the ability of people to perform BLS for cardiac and respiratory arrest. Some other studies also have a similar result, such as Muniarti et al. (2019) revealed that the simulation method in delivering BLS has a significant impact on increasing motivation to perform BLS and enhancing the skill of CPR.¹¹

Even though the study showed that BLS training has an important role on changing the knowledge and skill of respondent and statistically significant, this study has limitation regarding the number of participants, the type of participants, which are the medical students who

generally put themselves to be a medical practitioner in the future and no control group could be compared to in order to see the differentiation of the results. More rigorous study regarding BLS training should be done in the future to fill those gaps.

CONCLUSION

Dissemination of BLS training using the right method is inevitably needed to tackle the problem related to the sudden cardiac and pulmonary arrest. This study showed that the implementation of BLS training for medical students greatly impacts knowledge and skills. Thus, routine non-academic BLS training should be considered to increase both knowledge and skills amongst medical students.

DISCLOSURE

Conflict of Interest

The author declares no conflict of interest related to the material presented in this article.

Ethics Consideration

Ethics approval has been obtained by the Health Research Ethics Committee Faculty of Medicine Universitas Syiah Kuala and Dr. Zainoel Abidin Hospital Banda Aceh-Indonesia with KEPPKN Registration number: 1171012P and Ethical Expedited Number: 240/EA/FK-RSUDZA/2020, before study.

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Author Contribution

All authors equally contribute to the study from the conceptual framework, data gathering, and data analysis until reporting the study results through publication.

REFERENCES

1. AHA. About Cardiac Arrest [Internet]. 2021. Available from: <https://www.heart.org/en/health-topics/cardiac-arrest/about-cardiac-arrest>
2. Hamarno R. Keperawatan Kegawatdaruratan dan Manajemen Bencana. Jakarta Selatan. Pusdik SDM Kesehatan; 2016. 16 p.
3. Yayasan Jantung Indonesia. Bantuan Hidup Dasar [Internet]. 2015. Available

- from: <http://www.inaheart.or.id/bantuan-hidup-dasar/>
4. Lontoh C, Kiling M, Wongkar D. Pengaruh Pelatihan Teori Bantuan Hidup Dasar terhadap Pengetahuan Resusitasi Jantung Paru. *J Keperawatan*. 2013;1(1):1–5.
 5. Colquhoun M. Learning CPR at school-everyone should do it. *Resuscitation*. 2012;83(5):543–4.
 6. Lestari C. Pengaruh Pelatihan Bantuan Hidup Dasar (BHD) pada Remaja Terhadap Tingkat Pengetahuan Menolong Korban Henti Jantung. Muhammadiyah Yogyakarta; 2014. 31–40 p.
 7. Abdillah. Pengaruh Pemberian Pelatihan Bantuan Hidup Dasar Terhadap Peningkatan Pengetahuan dan Keterampilan pada Siswa SMKN 1 Geger Madiun. *J Chem Inf Model*. 2019;53(9):1689–99.
 8. Sudarman. Pelatihan Meningkatkan Keterampilan Siswa Kelas XI SMK Baznas Sulsel Dalam Melakukan Bantuan Hidup Dasar. *J Ilm Kesehat Sandi Husada*. 2019;10(2):95–102.
 9. Turambi. Pengaruh Pelatihan Bantuan Hidup Dasar (BHD) Terhadap Peningkatan Pengetahuan dan Keterampilan Siswa kelas XI Dan XII SMA Negeri 2 Langowan. *Bul Sariputra*. 2016;6(2):56–62.
 10. Greif R, Lockey A, Conaghan P. European Resuscitation Council guidelines for resuscitation 2015: section 10. Education and implementation of resuscitation. *Resuscitation*. 2015;95:288–301.
 11. Muniarti S, Herlina S. Pengaruh Simulasi Pelatihan Bantuan Hidup Dasar (BHD) Terhadap Motivasi Dan Skill Resusitasi Jantung Paru (RJP) Pada Karang Taruna RW 06 Kampung Utan Kelurahan Krukut Depok. *J Keperawatan Widya Gantari Indones*. 2019;3(2):1–12.



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