

Retention of basic life support in medical students of Airlangga University

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ABSTRACT

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Background: Cardiac arrest is one of the leading cause of death in the world with steadily increasing number over the years. Basic life support has been proven to lower the risks of tissue damage and further complication. Several study shows that BLS skill are lacking in some doctors and nurses.

Objective: Therefore, the purpose of this study is knowing the retention of basic life support in medical student of Airlangga University.

Methods: This descriptive study used cross sectional design. Subjects were students at faculty of medicine in Airlangga University who trained one year ago and completed their study of Basic Life Support. Fifty two subject were asked to practice their BLS techniques then scored based on modified American Hearth Assosiation (AHA)'s Basic life support skill checklist.

Results: Based on the data, the percentage of students who did the retest correctly: response checked by shouting 92.31% students, response checked by tapping 69.23% students, call for help 44.23% students, airway checked 48.08% students, breathing checked 46.15% students, correct hand placement 100% students, compression rate 78.85% students, compression ratio 75% students, position 94.23% students, and compression depth 78.85% students.

Conclusion: One year post training and test, 14 from 52 students could complete all the steps in basic life support skill. Less than a half of the students successfully done 3 out of 10 points that were being tested. Meanwhile, many aspects in circulation point show higher results all above 75%.

Latar Belakang: Henti jantung merupakan salah atau penyebab kematian tertinggi di dunia dan jumlahnya meningkat dari tahun ke tahun. Basic life support atau bantuan hidup dasar (BHD) terbukti dapat menurunkan kerusakan jaringan dan komplikasi lebih lanjut. Beberapa penelitian menunjukkan ketrampilan BHD pada tenaga medis, baik dokter maupun perawat masih kurang.

Tujuan: Melalui penelitian ini dapat diketahui retensi mengenai ketrampilan BHD pada mahasiswa Fakultas Kedokteran Universitas Airlangga.

Metode: Penelitian ini merupakan penelitian deskriptif dengan pendekatan cross-sectional. Subjek merupakan mahasiswa Fakultas Kedokteran Universitas Airlangga yang telah menjalani pelatihan BHD dan lulus dalam ujian setelahnya. Lima puluh dua mahasiswa diminta untuk mempraktekkan kembali teknik pemberian BHD dan dinilai menggunakan daftar penilaian modifikasi dari penilaian ketrampilan BHD milik American Heart Association (AHA).

Hasil: Persentase mahasiswa yang melakukan dengan benar, antara lain: periksa kesadaran-verbal

92.31%, periksa kesadaran-stimulasi nyeri 69.23%, mencari bantuan 44.23%, periksa jalan nafas 48.08%, periksa pernafasan 46.15%, titik tumpu kompresi 100%, kecepatan kompresi 78.85%, rasio kompresi 75%, posisi pemberian kompresi 94.23%, kedalaman kompresi 78.85% students.

Kesimpulan: Jangka waktu satu tahun setelah ujian, sebanyak 14 dari 52 mahasiswa berhasil melakukan BHD dengan urutan yang benar. Hanya 3 dari 10 item yang diujikan (re-test), dilakukan dengan benar oleh kurang dari separuh mahasiswa Namun, retensi untuk aspek-aspek pada poin sirkulasi didapatkan hasil yang cukup tinggi yakni diatas 75%.

INTRODUCTION

Cardiac arrest is a sudden event of stop cardiac function thus no longer able to cardiac function cessation. According to statistics from the AHA, the incidence of cardiac arrest in 2012 was 359,400 in the United States. Cardiopulmonary resuscitation (CPR) which is carried out several minutes at the beginning can reduce the risk of tissue damage and complications if done effectively.^{1,2} Training for Basic Life Support (BLS) in medical curriculum is a based to master the skills need for CPR. Some previous study showed that medical student's retention on BLS skills were still low.³⁻⁷ The decline of retention started around 6 months after training, some study said.⁸⁻¹⁰ Li(2013) in a previous research, reported that medical student's retention started to decline 3 months after training.⁶

Basic life support is a basic ability that medical staff and medical students must have in order to be ready to deal with emergency problems that may arise, both at the Hospital and in the community.⁴ This is represented by the presence of BLS examination in the Indonesian National Doctor Competency Examination (Uji Kompetensi Dokter Indonesia/UKDI). In addition to that, CPR is listed as a level 4A competence in Indonesian Doctor Competency Standard (*Standar Kompetensi Dokter Indonesia/SKDI*). Meaning, all doctors in Indonesia should master this skill. From above description, it can be concluded that BLS is an important skill that all doctors in Indonesia should master. Based on the

importance of BLS and the results of previous study, an assessment on medical student's retention in Fakultas Kedokteran Universitas Airlangga is needed.

METHODS

This study was a descriptive study with cross-sectional design. Subjects were third year preclinical medical student in Fakultas Kedokteran, no intervention was given to subjects. Inclusion criteria was medical students who had taken BLS training and had passes the BLS exams. Exclusion criteria was medical students who re-took the training after examination, students who had used BLS in real-life setting, and students who were in the Medical Support Team (Tim Bantuan Medis/TBM). Students who met the inclusion criteria were asked to perform BLS. This study was done a year after the first BLS examination, the evaluator and evaluation checklist between the first examination and this study were different. Subjects was read a clinical scenario and asked to response accordingly. During examination, students were recorded with a camera to be able to assess their performance in more detail. Assessment was done using modified checklist from BLS clinical skill checklist of American Heart Association and each point was observed with percentage.¹¹

RESULTS

Based on the results of observation from the checklist, 14 students were able to do all the steps correctly. For each point of the checklist, the student's results were as follow: 48 subjects did the verbal stimulus to check for consciousness, 36 subjects did the pain stimulus to check for consciousness, 23 subjects did shout for help, 25 subjects did open the airway, 24 subjects did check for breathing. In resuscitation focus, 52 subjects did chest compression in the right pressure point, 41 subjects did compression with the right speed, 39 subjects did compression in the right ratio, 49 subjects did chest compression in the effective position, and 41 subjects did compression with the right depth.

Table 1. Distribution of Completeness of Action Sequences of Fakultas Kedokteran Universitas Airlangga Students in Basic Life Assistance

Sequence	Total	Percentage
Complete	14	26,92%
Incomplete	38	73,08%

Table 2. Distribution of BLS Assessment Points in Fakultas Kedokteran Universitas Airlangga Students

POINTS	Frequency		Percentage	
	Yes	No	Yes	No
Check response -verbal	48	4	92.31%	7.69%
Check response -Pain	36	16	69.23%	30.77%
Call for help	23	29	44.23%	55.77%
Airway	25	27	48.08%	51.92%
Breathing	24	28	46.15%	53.85%
Compression-Pressure point	52	0	100%	0%
Compression-Velocity	41	11	78.85%	21.15%
Compression-Ratio	39	13	75%	25.00%
Compression-Body position	49	3	94.23%	5.77%
Compression-Depth	41	11	78.85%	21.15%

DISCUSSION

Total research subjects were 52 medical students. Based on Table 1, the students who manage to perform all the steps in the checklist were 14 subjects (26.92%). This figure has decreased, given the subjects were students who had all passed the previous BLS exam. This result is in accordance with previous research by Partiprajak and Madden.^{1,12}

The results of observation of checking response verbally and pain stimulus, each were 92,31% and 69,23%. Compared to previous research by Isbey which was done 3 months after test, the percentage obtained was higher than present study.¹³ The call-for-help point was done by 44.23% subjects. In previous research by Spooner 94% subjects did this point during re-examination.¹⁴ Less emphasis on the importance of seeking help can make students become indifferent to this step, so that many students are late in doing or not even doing it. Emphasizing the benefits of this action during training becomes

important, because performance when training can improve retention of CPR skills.¹⁵ Besides a difference in teaching method, the time span and re-evaluation in present study was different than Spooner where time span was 6 weeks, while present study was done 12 months after training.¹⁴

In Table 2, 25 subjects or 48.08% did airway patency correctly, which was using head tilt chin lift or jawthrust technique. Decreased retention was also reported in previous research by Donnelly(1998) from 88% to 55%.¹⁶ However Spooner(2007) reported increase from 92% to 94%.¹⁴

In airway point, 24 students did airway management correctly. The other 28 students did the step incorrectly or did not do this step at all.

In circulation management, a lot of points were assessed. In pressure point of chest compression, 100% students did the step correctly, which was lower half of the sternum. This high percentage showed that students had

good retention of this point.

For compression velocity, 78.85% subjects did compression in the right velocity, which was 100-120 times/minute. Most of the other 11.54% subjects did compression irregularly in one cycle or between cycle. While 9.62% subjects did the compression in a lower velocity, which was under 100 times/minute. This irregular and inappropriate velocity was grouped into one category, which was incorrect. The irregular velocity is probably because students are not used to listening 100-120 times/minute rhythm, thus some of them were still doubtful while doing compression. Idris(2012) reported that compression in 100-120 times/minute velocity can optimally induce blood flow.¹⁷ It was also reported that patients who received compression less than 75 times/minute has decreased Return of Spontaneous Circulation (ROSC) probability, because of too many interruption during chest compression.

For chest compression points, 75% students did the CPR in the right ratio. Based on ERC 2010 guideline, the correct ratio is 30:2. While the other 25% did compression incorrectly. During observation, the biggest obstacles were students concentration while counting the amount of compression, thus sometimes they stopped halfway which will cause delay in chest compression even in a short amount of time.

Based on Table 2, 94.23% medical students did chest compression in the right position, by keeping their arms straight during compression. This position is important because it affects its effectivity and helper's endurance while doing chest compression. Ineffective position can cause exhaustion, making the helper unable to continue CPR in a longer duration. Retention in UNAIR students are higher than previous research by Spooner which only showed 80% in re-test.¹⁴

In compression depth points, 78.85% students (Table 2) did compression in the right depth. The other 21.15% did compression with less than 5 cm deep. Compression depth is important to provide optimal BLS, because insufficient depth will not help the heart to pump out blood, thus life support will be meaningless.

This result is in accordance with previous research by Spooner where compression depth points were decreased from 88% to 68%.¹⁴ This figure is lower than present study in Fakultas Kedokteran Universitas Airlangga, showing that student's retention in Universitas Airlangga is better.

The results of this study is quite unique, where detailed things in chest compression technique has better retention compared to things that are actually simpler and easier to do. The limitation of present study is we could not obtain the previous examination scores of the subjects, thus the two could not be compared. However, we hope that our study can be a source of reference and evaluation for BLS training in the future, and give optimal retention.

CONCLUSION

In 1 year post examination, only 14 of 52 subjects did BLS correctly and sequentially. The results of re-test under 50% was obtained in point shout-for-help, airway patency, and breathing. While other aspects of circulation points were quite high, which was above 75%.

Further research using time series method or using some kind of intervention in research subjects is needed, to analyze the best learning method for BLS.

CONFLICT OF INTEREST

We declare that there is no conflict of interest.

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Non declare

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