

# Study of Basic-Life-Support Training for College Students

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**Objective:** To study about attitude and knowledge regarding basic-life-support among college students outside medical system.

**Material and Method:** The cross-sectional study in the emergency department of Thammasat Hospital. The authors included college students at least aged 18 years old and volunteers to be study subjects. The authors collected data about attitudes and knowledge in performing basic-life-support by using set of questionnaires.

**Results:** 250 college students participated in the two hours training program. Most of participants (42.4%) were second-year college students, of which 50 of 250 participants (20%) had trained in basic-life-support program. Twenty-seven of 250 participants (10.8%) had experience in basic-life-support outside the hospital. Most of participants had good attitude for doing basic-life-support. Participants had a significant improved score following training (mean score 8.66 and 12.34, respectively,  $p < 0.001$ ). Thirty-three of 250 participants (13.2%) passed the minimum score before trained testing, whereas 170 of 250 participants (68%) passed the minimum score after trained testing.

**Conclusion:** With accurate knowledge and experience, lay rescuers may have more confidence to perform basic-life-support to cardiac arrest patient. The training program in basic-life-support has significant impact on knowledge after training.

**Keywords:** Basic-life-support, Out-of-hospital cardiac arrest, Bystander CPR, Lay rescuer

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Cardio-pulmonary arrest is a major cause of death and disability in persons worldwide<sup>(1)</sup>. Out-of-hospital cardiac arrest (OHCA) is defined as a sudden and unexpected pulseless condition attributable to cessation of cardiac mechanical activity<sup>(2)</sup>. In 2013, 424,000 people experience OHCA in the United States<sup>(3)</sup>. There is no real data collected about incidence of OHCA in Thailand.

Outcome of OHCA patient from large cumulative meta-analysis study to date documented a hospital admission rate of only 23.8% and a mean survival to hospital discharge of only 7.6%<sup>(4)</sup>. In Thailand, reported a return of spontaneous circulation rate of about 22-38% and a survival to hospital discharge rate of only about 0-5%<sup>(5-7)</sup>.

Several factors seem to be associated with an

increased chance of survival in OHCA: bystander cardio-pulmonary resuscitation (CPR), witnessed arrest, initial shockable cardiac rhythm, and short response time to defibrillation<sup>(8,9)</sup>. American Heart Association (AHA) also announces the importance of the Chain-of-Survival, immediate recognition of cardiac arrest and activation of an emergency response system with early basic-life-support, and advance-life-support in hospital<sup>(10)</sup>. Many studies reported an increase in the survival rate among cardiac arrest patients who received bystander basic-life-support<sup>(11-14)</sup>. However, the CPR data registry of Thammasat Hospital shows only 16% of all OHCA patients received bystander basic-life-support. No study has been undertaken concerning the attitudes and knowledge regarding basic-life-support among people outside medical system.

The objectives of the present study were to determine attitudes or factors corresponding to performing basic-life-support among people outside the medical system and to determine theoretical knowledge on basic-life-support before and after short

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periods training. This study have approved from the Human Research Ethics Committee of Thammasat University.

## Material and Method

### Study design and setting

This cross-sectional study was conducted in the emergency department of Thammasat Hospital, Pathumthani province, Thailand. Thammasat Hospital is located within Thammasat University campus.

### Study population and data collection

Data were collected retrospectively from 1 March 2013 to 28 February 2014. After the announcement for free basic-life-support training campaign, the present study included college students aged at least 18 years old and volunteers to be study subjects. Informed, written consent by the participants were documented and verbal. The authors excluded subjects who cannot finish the training or did not consent to data collection.

The authors collected data about attitudes in performing basic-life-support by using a set of questionnaires<sup>(15,16)</sup>. All participants had to complete the questionnaires before starting training. The questionnaire consists of participant background, experience involved in emergency medical service, and attitude in performing basic-life-support.

The authors used 15 multiple-choice questions to determine knowledge in basic-life-support<sup>(16)</sup>. All participants had to finish the questions before and after training. The minimum requirement to pass the test was 80% correct (based on 12 questions).

All participants had to undergo a two-hour training program. The trainers were staff in the Emergency Department of Thammasat Hospital. The training program started with a lecture on basic knowledge followed by scenario-based learning and practice-based learning, integrated into the training program.

### Statistical analysis

The authors presented descriptive data as frequencies and percentages. Continuous data were expressed as mean with SD or median with interquartile range. The authors used Likert scale to present attitude in performing basic-life-support<sup>(17,18)</sup>. Comparison of tested scores before and after training of same group of participants was made by using Student's t-test; *p*-value <0.05 was considered statistically significant. The authors performed all analysis with STATA data analysis and statistical software.

## Results

Two hundred and fifty college students participated in the two-hour training program. Table 1 shows baseline characteristics of participants. A majority of the participants was female (64.8%). The mean (SD) age was 20.18 (1.47) years. All participants were college students of the first to sixth years when the study was conducted. Most of participants (42.4%) were second-year college students; whereas participants in third and first years college were second (24%) and third (20.4%) of the participants, respectively.

Table 2 shows awareness and experience in emergency medical service of the participants. One

**Table 1.** Baseline characteristics of college students participated in training program

Characteristic	n = 250	%
Male gender	88	35.20
Age (year); mean (SD)	20.18 (1.47)	
Level of education		
First year college student	51	20.40
Second year college student	106	42.40
Third year college student	60	24.00
Forth year college student	13	5.20
Fifth year college student	13	5.20
Sixth year college student	7	2.80

**Table 2.** Awareness and experience involved in emergency medical service

General knowledge and experience	n = 250	%
Had admitted to Thammasat Hospital	165	66.00
Aware of emergency medical service system	107	42.80
Had used the emergency medical service system	41	16.40
Had seen a patient in cardiac arrest outside hospital	12	4.80
Experience involved in basic-life-support	27	10.80
Had trained in basic-life-support program	50	20.00

hundred and seven of 250 participants (42.8%) were aware of emergency service systems, but only 41 of 250 participants (16.4%) had used these services. Regarding experience in basic-life-support, 50 of 250 participants (20%) had trained in basic-life-support program. Twenty-seven of 250 participants (10.8%) had experience in basic-life-support outside the hospital, of which 12 of 250 participants (4.8%) encountered cardiac arrest patients.

Table 3 shows attitudes of participants for doing basic-life-support outside the hospital. From the 250 participants, they had had a good attitude for providing basic-life-support. They showed total agreement about the duty of every person in helping patients and the importance of prior knowledge. If they possessed knowledge, they would feel confident in performing chest compression for rescuing patients.

Table 4 shows test scores before and after

**Table 3.** Attitude of participants for doing basic-life-support outside hospital

Attitude question	Level of agreement n (%)					Mean (SD)
	Totally agree (5)	Agree (4)	Not sure (3)	Not agree (2)	Totally not agree (1)	
Helping patient is the duty of every person	142 (56.80)	84 (33.60)	15 (6.00)	9 (3.60)	0	4.44 (0.76)
Prior knowledge is required, before helping any patient	186 (74.40)	61 (24.40)	3 (1.20)	0	0	4.73 (0.47)
You can help the patient with cardiac arrest by yourself	52 (20.80)	80 (32.00)	106 (42.40)	7 (2.80)	5 (2.00)	3.67 (0.90)
You will start chest compression immediately in patient with cardiac arrest	30 (12.00)	40 (16.00)	107 (42.80)	47 (18.80)	26 (10.40)	3.00 (1.12)
Emergency medical service is not need in patient with cardiac arrest	5 (2.00)	21 (8.40)	105 (42.00)	78 (31.20)	41 (16.40)	2.48 (0.93)
To help quickly is more important than accuracy in the rescue	11 (4.40)	22 (8.80)	46 (18.40)	107 (42.80)	64 (25.60)	2.24 (1.07)
Helping patient is the duty of medical personal only	1 (0.40)	15 (6.00)	35 (14.00)	132 (52.80)	67 (26.80)	2.00 (0.83)
To prevent error, you will waiting for medical personal to help the patient	5 (2.00)	46 (18.40)	80 (32.00)	105 (42.00)	14 (5.60)	2.69 (0.90)
It is important to bring cardiac arrest patient to the hospital by yourself as soon as possible	15 (6.00)	60 (24.00)	74 (29.60)	77 (30.80)	24 (9.60)	2.86 (1.08)
If you have knowledge, you can be confident in chest compression to rescue the patient	128 (51.20)	95 (38.00)	21 (8.40)	4 (1.60)	2 (0.80)	4.37 (0.77)

**Table 4.** Test score before and after basic-life-support training from 250 college students

Test score (maximum 15 point)		p-value
Before training; mean (SD)	After training; mean (SD)	
8.66 (2.37)	12.34 (1.62)	<0.001

training of the 250 participants. After two hours of basic-life-support training, participants had significantly improved scores (mean score 8.66 and 12.34, respectively,  $p < 0.001$ ). Thirty-three of the 250 participants (13.2%) passed the minimum score in before trained testing, whereas 170 of 250 participants (68%) passed the minimum score in after trained testing.

### Discussion

Cardiac arrest patient, who received bystander basic-life-support, had higher survival rates. This is an observational study of basic-life-support training among college students. The authors presented data from 250 participants before and after 2 hours training. In present study, only 20% of participants had trained in basic-life-support program. Compared with Harris Interactive survey, conducted on behalf of the AHA, 60% of United States residents were familiar with CPR<sup>(3)</sup>.

The authors observed that most of participants had good attitude to perform basic-life-support. If they had knowledge, they will possess confidence in rescuing patients. This finding was consistent with other studies, 98% of United States residents recognize the importance of devices to restore a normal heart beat among victims of sudden cardiac arrest and 79% of lay public were confident that they knew what actions to take in a medical emergency<sup>(3)</sup>. In contrast, without having knowledge and lack of experience most of participants were not sure how to perform and may need to wait for medical personal or bring the patient to a hospital by themselves. This finding was consistent with the study in Italy, where lay rescuers capable of performing CPR, feared infection, being capable, legal implications, and causing further damage<sup>(19)</sup>. One of the studies, from France, even their medical students felt unprepared to conduct basic-life-support due to the lack of theoretical knowledge<sup>(15)</sup>.

Comparison of scores before and after training testing, participants showed a significantly improved score resulting from training. This finding was consistent with the other studies that teaching basic-life-support to school children, showed highly significant improvement in knowledge and retention of knowledge in basic-life-support after training<sup>(20-22)</sup>.

### Limitations of study

The present study has several limitations. First, we did not assess retention of knowledge in basic-life-support after a single course of training, as their

level of knowledge may decrease over time. Because the participants come from different faculties and places, it is not possible to arrange for all of the participants to repeat paper testing. The authors should develop the means to make it possible for the participants to finish their test online.

Second, the authors cannot predict the outcome in real life situation after participants finish their training. The participants came from different places; CPR data registry cannot assess this outcome in specific places.

Finally, the authors cannot assess the factor effect chest compression by bystander because there are too few a number of participants who had experience with cardiac arrest patients. However, the result from our study showed that if they had knowledge, the participants may be confident and have a good attitude to start basic-life-support.

### Conclusion

With accurate knowledge and experience, lay rescuers may be more confident to perform basic-life-support on cardiac arrest patients. The training program in basic-life-support has significant impact on knowledge after training.

### What is already known on this topic?

Several factors seem to be associated with an increased chance of survival in cardiac arrest patients: bystander cardio-pulmonary resuscitation, witnessed arrest, initial shockable cardiac rhythm, and short response time to defibrillation. American Heart Association (AHA) also announces the importance of the Chain-of-Survival, immediate recognition of cardiac arrest and activation of the emergency response system with early basic-life-support, and advance-life-support in hospital. There are many studies reporting an increase in survival rates among cardiac arrest patients who received bystander basic-life-support. The CPR data registry of Thammasat Hospital shows only 16% of all OHCA patients received bystander basic-life-support.

### What this study adds?

There had been no study about attitudes and knowledge regarding basic-life-support among populations outside medical system.

With accurate knowledge and experience, lay rescuers may be more confident to perform basic-life-support on cardiac arrest patients. The training program in basic-life-support has significant impact on knowledge after training.

### Acknowledgement

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### Potential conflicts of interest

None.

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## การศึกษาการฝึกช่วยชีวิตขั้นพื้นฐานสำหรับประชาชนในระดับอุดมศึกษา

วินชนะ ศรีวิไลทนต์, กัมพล อำนวยพัฒน์พล, จิตรลดา ลิ้มจินดาพร, อินทนนท์ อิมสุวรรณ, เกียรติชัย ดาวรัตน์ชัย

**วัตถุประสงค์:** เพื่อศึกษาถึงทัศนคติและความรู้เกี่ยวกับการช่วยชีวิตขั้นพื้นฐานของประชาชนทั่วไประดับอุดมศึกษาที่ไม่ใช่บุคลากรทางการแพทย์  
**วัสดุและวิธีการ:** ทำการศึกษาเชิงวิเคราะห์ ณ จุดเวลา แบบตัดขวางที่ห้องฉุกเฉินโรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ เก็บข้อมูลจากนักศึกษา  
ระดับอุดมศึกษาที่มีอายุ ตั้งแต่ 18 ปีขึ้นไปและสมัครใจเข้าร่วมโดยใช้แบบสอบถามเก็บข้อมูล ทัศนคติ และความรู้ในการช่วยชีวิตขั้นพื้นฐาน

**ผลการศึกษา:** การศึกษานี้มีผู้เข้าร่วมในการอบรมทั้งหมด 250 ราย ผู้เข้าร่วมส่วนใหญ่ร้อยละ 42.4 เป็นนักศึกษาอุดมศึกษาชั้นปีที่ 2 ผู้เข้าร่วมจำนวน  
50 รายหรือร้อยละ 20 เคยได้รับการฝึกอบรมการช่วยชีวิตขั้นพื้นฐานมาก่อนผู้เข้าร่วมจำนวน 27 รายหรือร้อยละ 10.8 เคยมีประสบการณ์การช่วยชีวิต  
ขั้นพื้นฐานนอกโรงพยาบาลผู้เข้าร่วมส่วนใหญ่มีทัศนคติที่ดีในการทำการช่วยชีวิตขั้นพื้นฐาน ผู้เข้าร่วมทำคะแนนทดสอบได้สูงขึ้นอย่างมีนัยสำคัญทางสถิติ  
(คะแนนเฉลี่ยก่อนอบรม 8.66 และคะแนนเฉลี่ยหลังอบรม 12.34,  $p < 0.001$ ) ผู้เข้าร่วมจำนวน 33 รายหรือร้อยละ 13.2 มีคะแนนผ่านเกณฑ์  
ในการทดสอบก่อนการอบรม ในขณะที่ผู้เข้าร่วมจำนวน 170 รายหรือร้อยละ 68 มีคะแนนผ่านเกณฑ์ในการทดสอบหลังการอบรม

**สรุป:** เมื่อมีความรู้และประสบการณ์ที่ถูกต้อง ประชาชนทั่วไปอาจจะมีความมั่นใจมากขึ้นในการทำการช่วยชีวิต ขั้นพื้นฐานแก่ผู้ป่วยหัวใจหยุดเต้น  
การจัดการอบรมการช่วยชีวิตขั้นพื้นฐานมีผลสำคัญต่อการเพิ่มความรู้หลังการอบรม

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