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Awareness about basic life support among health science students at Duy Tan University

Duong Thi Ngoc Bich[1], Ha Thi Thu[1]
[1]Duy Tan University, Da Nang

ABSTRACT

***Objectives**: To evaluate the level of awareness about basic life support among health science students at Duy Tan University and to identify associated factors with this awareness.* ***Methods**: A cross-sectional descriptive study was conducted on 244 2nd, 3rd, and 4th-year healthcare students at Duy Tan University from January to May 2023. A self- administered questionnaire was used to measure basic life support awareness.* ***Results**: The study found that 68.9% of students had a low level of basic life support awareness, 29.5% had an average level, and only 1.6% had a high level. Medical students exhibited a significantly higher mean basic life support awareness score compared to odonto-stomatology and nursing students ($p < 0.05$). Factors such as faculty of study, grade point average, previous basic life support participation, training organization, and voluntary basic life support implementation were significantly associated with basic life support awareness ($p < 0.05$).* ***Conclusion**: The awareness of basic life support among students at Duy Tan university is still low. There is a clear need to improve both knowledge and practical skill in basic life support for health science students.*

***Keywords**: Awareness, basic life support, health science students.*

INTRODUCTION

According to the American Heart Association (AHA) 2022 report, there are more than 356,000 out-of-hospital cardiac arrests (OHCAs) annually in the United States, nearly 90% of which are fatal [1]. Appropriate basic life support (BLS) intervention in the first few minutes can double or triple a person's odds of survival [2]. Therefore, basic life support can improve patient survival rates. Adequate knowledge and awareness of BLS and cardiopulmonary resuscitation (CPR) is crucial to ensure individuals can perform life-saving measures in emergencies [3]. BLS involves immediately recognizing signs of sudden cardiac arrest (SCA), heart attack, stroke, and foreign body airway obstruction (FBAO); Activating the emergency response system; performing rapid cardiopulmonary resuscitation; and facilitating rapid defibrillation with an automated external defibrillator (AED). BLS forms the foundation for saving lives after cardiac arrest [4]. Research on awareness of basic life support among health science students is essential to provide scientific basis and cognitive and behavioral orientation for students.

Cor. author: Duong Thi Ngoc Bich
Email: duongtngocbich@dtu.edu.vn
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The demand for BLS courses is increasing in developed countries, while in underdeveloped and developing countries, regular training is lacking [3]. Studies such as those conducted at Taif Medical University in Saudi Arabia showed a low level of BLS awareness among 5th and 6th year medical students. This study showed that only 25 (12.8%) out of 196 participating students had adequate BLS knowledge and no student had excellent BLS knowledge [5]. The study by Vausevan et al in India evaluated medical and nursing students, showing that 3.7% of medical students and 17.4% nursing students have good BLS knowledge. The study also showed that the average score of nursing students (6.6 ± 2.5) was significantly higher than that of medical students (8.5 ± 2.8) [6]. In Vietnam, limited studies have been conducted on BLS awareness among medical students. Research by Nguyen Thi Khanh Linh in Da Nang emphasized the need for initial first aid training among university students. The results showed that the rate of students answering correctly about BLS was 25.72% and the need for initial first aid training is 93.8% [7]. A study by Dinh Hung Vu et al revealed reasons why bystanders did not perform CPR at the scene included "not realizing the condition was cardiac arrest" (60%), "don't know how to perform CPR" (33%) and "afraid of harming the patient" (7 %). Only seven percent of bystanders were trained in CPR. The results indicate a need to increase the use of emergency medical services and the provision of CPR. Providing awareness and training to community members on the role of emergency medical services, cardiac arrest recognition, CPR skills, and dispatcher training to assist bystanders is important. important to improve outcomes of patients with out-of-hospital cardiac arrest in Vietnam [8].

Given the importance of good knowledge, attitude, and practice regarding Basic Life Support (BLS), it is crucial for health science students to have a solid understanding of CPR. While training programs in cardiopulmonary resuscitation are available at most universities, there is a lack of studies evaluating BLS awareness among medical and nursing students. Hence, this study aims to describe the awareness of BLS among health science students at Duy Tan University and explore related factors.

RESEARCH OBJECTIVES AND METHODS

Research participants

Inclusion Criteria: The study included second, third and fourth-year students in the fields of general medicine, dentistry and nursing at Duy Tan University who were enrolled in the Basic Nursing course I. These students had been introduced and practiced first aid and basic life support.

Exclusion criteria: Students who had not completed Basic Nursing course I were excluded from the study. Pharmacy students, who do not take Basic Nursing course I, were not included in the study.

Location and timing of research: The research was conducted at Duy Tan University from January 2023 to May 2023.

Research design: A cross-sectional descriptive study.

Sampling method: A convenience sampling method was employed.

Sample size and sampling method

Sample size: 244 students

The sample size was calculated using the mean one estimate formula:

$$n = \frac{Z_{(1-\alpha/2)^2} \cdot \sigma^2}{d^2}$$

In the following section:

- n: the minimum sample size required for the study. $Z_{1-\alpha/2} = 1.96$ with 95% confidence level. $\sigma = 0.38$: standard deviation (based on research by Ebraheem Albazeeet al) [9].

d = 0.05: the acceptable error level

An additional 10% of students are anticipated not to complete the questionnaire.

Finally, the sample size is 244 students.

Measurements: The questionnaire includes 2 parts:

Part A: Demographic characteristics of research subjects: This section includes 10 questions (gender, year of birth, Faculty, year of study, cumulative GPA, participation in previous Basic Life Support (BLS) training, organized training, voluntarily performance of BLS, knowledge of BLS).

Part B: Awareness of BLS: This section includes 20 items (based on a study by Ebraheem Albazeeet al) [9]). The total score ranges from 0 to 20, with categories of 16-20 (high), 11-15 (medium), and 0-10 (low) awareness levels. Following translation of the scale from English to Vietnamese, expert opinions were sought for content validation. A pilot study involving 30 students from the Medicine, Dentistry, and Nursing departments at Duy Tan University was conducted, resulting in a Cronbach's alpha index of 0.76.

Data collection: Data was collected for 2 weeks (from March 10, 2023, to March 24, 2023) using a self-administered questionnaire. Before conducting the research, the investigator distributed survey forms and addressed any questions related to the study, questionnaire, and the research procedures.

Data processing method: After coding, the data was entered, cleaned and analyzed using SPSS 20.0 and Excel 2010 software. Demographic data and participants' perceptions of BLS were analyzed using descriptive statistics. Independent-Samples t-test and One-way ANOVA, with post hoc ANOVA, were utilized to compare differences in research subject characteristics with students' perceptions of BLS.

Research ethics: Participation in the study was voluntary, and participant information and collected data were treated confidentially and solely used for research purposes. The study was conducted after receiving approval from the Biomedical and Pharmacy Ethics Council of Duy Tan University.

RESULTS

Table 1. Characteristics of study subjects (n = 244)

Characteristic		n	%
Sex	Male	83	34.0
	Female	161	66.0
Majors	General medicine	82	33.6
	Dentistry	81	33.2
	Nursing	81	33.2

Characteristic		n	%
School year	2nd	81	33.2
	3rd	81	33.2
	4th	82	33.6
Cumulative GPA (on a 4-point scale)	Excellent (3.60 – 4.00)	20	8.2
	Good (3.20 – 3.59)	94	38.5
	Fair (2.50 – 3.19)	130	53.3
Participate in previous BLS training	Yes	163	66.8
	No	81	33.2
If yes, the training is held in	School	147	60.2
	Hospital	16	6.6
Voluntarily perform BLS	Yes	92	37.7
	No	135	55.3
	Yes, but not voluntarily	17	7.0

The results indicated that most students were female, with 161 individuals (66%). Among students, the highest number achieving good academic performance was 120 students, representing 53.3% of the total sample. Of the participants, 163 students (66.8%) had undergone previous BLS training, with 147 students (60.2%) having received BLS training at school.

Table 2. Assess the level of awareness of basic life support (BLS)

Level	Frequency (n)	Percentage (%)
High	4	1.6
Average	72	29.5
Low	168	68.9

Regarding awareness of basic life support within medical, dentistry, and nursing students, the level was categorized as follows: low awareness at 68.9%, moderate awareness at 29.5%, and high awareness at 1.6%.

Table 3. Proportion of correct answers about basic life support (n = 244)

Content	Total n (%)	General medicine n (%)	Dentistry n (%)	Nursing n (%)
BLS is the abbreviation	196 (80.3)	68 (27.9)	65 (26.6)	63 (25.8)
AED is the abbreviation	115 (47.1)	42 (17.2)	37 (15.2)	36 (14.8)
EMS is the abbreviation	177 (72.5)	59 (24.2)	60 (24.5)	58 (23.8)
Seeing someone unresponsive on the road, react first	152 (62.3)	50 (20.5)	52 (21.3)	50 (20.5)
Confirm that someone is unresponsive even after shaking and shouting at him or her, then take immediate action	107 (43.9)	37 (15.2)	38 (15.6)	32 (13.1)
Cardiac compression position for adults	135 (55.3)	42 (17.2)	46 (18.9)	47 (19.3)
Location of chest compressions in newborns	91 (37.3)	35 (14.3)	29 (11.9)	27 (11.1)
Do not want to give mouth-to-mouth CPR, which is not an appropriate action	104 (42.8)	37 (15.2)	35 (14.4)	32 (13.2)
Breathing for newborns	93 (38.1)	37 (15.2)	31 (12.7)	25 (10.2)
Depth of external chest compression for adults	91 (37.3)	34 (13.9)	30 (12.3)	27 (11.1)
Depth of extrathoracic compression in older children	96 (39.3)	30 (12.3)	33 (13.5)	33 (13.5)
Depth of extrathoracic compression in newborns	99 (40.6)	38 (15.6)	35 (14.3)	26 (10.7)
Frequency of external chest compressions for adults and older children	98 (40.2)	33 (13.5)	33 (13.5)	32 (13.1)
Correct adult CPR rate when a rescuer is present	114 (46.7)	39 (16)	37 (15.2)	38 (15.6)
Rate of compression and ventilation for newborns	82 (33.6)	27 (11.1)	28 (11.5)	27 (11.1)
While eating in the cafeteria, suddenly he had symptoms of choking, your action	84 (34.4)	30 (12.3)	28 (11.5)	26 (10.7)
A child suddenly chokes while playing with a toy and the child is unable to cry and/or cough, your response	123 (50.4)	44 (18.0)	47 (19.3)	32 (13.1)
An adult victim was unresponsive and was removed from being submerged in fresh water. The victim was breathing but unresponsive. First reaction	101 (41.4)	39 (16.0)	36 (14.8)	26 (10.7)
Your colleague suddenly slurred his speech and had weakness in his right upper limb. Your action	106 (43.4)	35 (14.3)	35 (14.3)	36 (14.8)
A 50-year-old man presented with retrosternal chest discomfort, profuse sweating, and vomiting. Most appropriate action	101 (41.4)	37 (15.2)	32 (13.1)	32 (13.1)

Students demonstrated the highest accuracy rates in answering questions related to BLS abbreviations (80.3%), EMS (72.5%), reactions to encountering an unresponsive individual on the road (62.3%), the correct cardiac compression position for adults (55.3%), and responding to a child choking (50.4%).

Conversely, the lowest percentage of correct responses was observed for questions concerning the "Rate of compression and ventilation for newborns" (33.6%), and "sudden choking symptoms while eating in the cafeteria" (34.4%).

Table 4. Relationship between demographic characteristics and basic life support awareness scores (n = 244)

Characteristic		Perception score			
		n	Mean ± SD	t/F	p
Faculty	General Medicine	82	9.87 ± 2.82		
	Dentistry	81	8.86 ± 3.01	4.28	0.0152*
	Nursing	81	8.65 ± 2.64		
Cumulative GPA (on a 4-point scale)	Excellent (3.60 – 4.00)	20	13.30 ± 2.29		
	Good (3.20 – 3.59)	94	9.30 ± 2.75	32.67	< 0.0012**
	Fair (2.50 – 3.19)	130	8.37 ± 2.44		
Participate in previous BLS training	Yes	163	9.43 ± 2.85	2.33	0.0211*
	No	81	8.53 ± 2.82		
If yes, the training is held in	School	147	9.60 ± 2.73	2.33	0.0211*
	Hospital	16	7.88 ± 3.50		
Voluntarily perform BLS	Yes	92	9.90 ± 2.77		0.0022**
	No	135	8.76 ± 2.81	6.21	
	Yes, but not voluntarily	17	7.94 ± 2.97		

[1]T-test, [2]One-way ANOVA, *p < 0.05; **p < 0.01

There is a difference between the average cognitive scores of BLS and faculty, cumulative average scores, having participated in training courses, training places, and voluntarily performing basic life support (p < 0.05).

Post hoc ANOVA analysis was conducted to assess the impact of three faculty groups (general medicine, dentistry surgery, nursing) on the average BLS cognitive score. Statistically significant differences were identified among the three groups for the dependent variable, with p (1-2) < 0.001, p (1-3) < 0.001, p (2-3) = 0.008 < 0.05.

Similarly, post hoc ANOVA analysis was employed to evaluate the influence of three cumulative average score groups (excellent, good, fair) on average BLS cognitive scores. A statistically significant distinction was observed between the general medicine and nursing faculties for the dependent variable, with p (1-3) < 0.005. However, no significant differences were found between the general medicine and dentistry faculties p (1-2) = 0.71 > 0.05, while the dentistry and nursing groups showed a significant difference p (2-3) = 0.305 < 0.05.

DISCUSSION

In this study, the level of basic life support awareness among health science students was found to be at a low level of 68.9%. This can be explained by the fact that students only learn the theory and practice of basic life support skills at school for a short amount of time (only a brief 3-hour lesson in the coursework), which is not enough for students to remember and practice BLS. Furthermore, the lack of real-life emergency experiences contributes to the challenge of retaining and applying BLS knowledge. This result is similar to the study conducted by Akhlaghdoustand in Iran and Amrutha in India [10, 11].

While most students could accurately identify the abbreviation of Basis Life Support (BLS) and seek safety first before there is an unconscious victim on the street. Recognizing the abbreviation such as EMS and AED can save time and effective emergency responses. However, more than 50% of students struggled with recalling the correct abbreviation of AED, 72.5% selected the correct EMS. Furthermore, less than 50% of students were able to correctly identify the first step of starting the survival chain when confirming someone who is not responding even after shaking and shouting at the person, the immediate action is to activate EMS.

The findings of this study align with Albazee's research results on medical students in Jordan [9], emphasizing the impact of acronym length and the contextual familiarity on students' ability to recognize acronyms [12]. Commonly used acronyms like BLS and CPR, frequently encountered in cardiopulmonary resuscitation training manuals, are easier for students to remember due to their simplicity and relevance to specialized English terminology. Additionally, these acronyms are commonly utilized in specific contexts such as CPR classes or emergency scenerios, faciliatating students' association of the acronyms with their meanings. In constrast, AED is longer than BLS acronyms and less commonly used. AED, being more complex and less familiar, requires additional cognitive effort for students to remember and associate with its intended context.

When the heart stops beating, the brain faces the risk of damage within 4-6 minutes. Without oxygen, permanent brain damage can occur in approximately 10 minutes. Hence, time is a critical factor in saving the life of someone experiencing cardiac arrest. Delaying CPR post cardiac arrest often results in poor outcomes. For each minute without CPR, the survival rates following cardiac arrest from ventricular fibrillation decline by 7–10% [13]. Therefore, proficient and high-quality CPR plays an important role in saving a life, especially in out-of-hospital emergency care. While over 50% of students had correct knowledge about chest compression positions for adults, the correct response rate for chest compression positions for infants was only 37.3%. The lowest level of basic life support knowledge is "rate of chest compressions and artificial ventilation for newborns", with only 33.6% of students answering correctly. Among these students, 11% are from the Faculty of Medicine and Nursing, while 11.5% belong to the Faculty of Dentistry. Students may rarely encounter cases in newborns, so they tend to overlook this scenario. This result constrasts with a study by Amrutha et al., which showed that the lowest rate of BLS knowledge was "the first response when an adult victim is submerged in fresh water" [10]. Understanding the accurate position, pace,

depth, and ratio for chest compressions and ventilation can enhance survival rates, underscoring the importance of bolstering student awareness and encouraging more frequent practice.

The percentage of students answering correctly regarding handling situations was relatively low, at 33.4%, 41.4%, and 43.4%; however, more than half of the students managed the situation correctly. In a scenario where a child suddenly choked while playing with a toy and was unable to cry or cough, most General Medicine students exhibited a higher correct answer rate compared to Dentistry and Nursing students. General medicine students learn about cardiopulmonary resuscitation across a broader range of subjects than the other two majors. In addition, medical students often engage in simulation classes focused on managing emergency situations. Therefore, it is necessary to increase the duration of simulation practice to expose students to more realistic scenarios, enhancing awareness and aiding in longer retention through practical experiences in basic life support.

The study results showed that there was no difference in basic life support knowledge scores between genders. This is consistent with the study of Albazee et al in Jordan [9]. However, Al-Shamiri et al found that men had a higher average score (45.41 ± 10) than women (42.31 ± 16.3), with a statistically significant difference ($p < 0.01$) [14]. Medical students had a higher BLS cognitive average score than dental and nursing students ($p < 0.05$), and academically excellent students outperformed those classified as good or fair. This is consistent with the research of Ebraheem Albazee et al [9]. Their research found that there are differences between different schools, school years, and cumulative GPA [9]. During the training program, medical students have the opportunity to learn more deeply and thoroughly about basic and advanced cardiopulmonary resuscitation through many subjects such as Preclinical, Internal Medicine, Surgery, and Simultaneous Emergency Resuscitation. They also practice simulated cardiopulmonary resuscitation situations at Duy Tan University's Medical Simulation Practice Center. Through the accumulation process, medical students develop stronger retention capabilities compared to their peers in other disciplines.

Another study conducted by Maha A. Al-Mohaissen in 2017 in Saudi Arabia showed that 98.3% of students without previous BLS training expressed a desire for additional BLS training, in contrast to 87.9% of students with previous BLS training. In addition, students without prior training indicated a preference for receiving BLS training earlier and more frequently, with 78.5% supporting the idea of mandatory BLS training. Students who had previously undergone BLS training during their college education demonstrated significantly higher BLS knowledge scores compared to those who had received BLS training outside of college (41.7 ± 13.0 vs. 32.4 ± 10.9, $p < 0.01$) [15]. This result is similar to our results, indicating that students who have participated in BLS training courses have higher average cognitive scores than those who have not participated ($p < 0.05$). This shows that the impact of limited opportunities for strengthening basic rescue knowledge and skills on students' BLS expertise.

In addition, the number of classes is too large and there are quite a few students in one class. Currently, students only learn theory

and practice skills for CPR techniques, lacking hours of participation in simulation classes and handling real-life situations. There is a need for further research on first aid protocols that students can apply both in clinical settings and everyday life, emphasizing practical training in simulated environments using manikins. Kanstad's analysis [16] showed that the respondents' knowledge level increased with age and previous first aid training, whether in high school or through postgraduate courses/ courses. The findings of this study correspond with the observations of other researchers indicating that BLS training should begin as early as possible. Furthermore, it needs to be revised every year as this seems to be the most effective way to refresh skills [17].

Limitations of the study: Our study initially evaluated the self-awareness of basic life support in medical, dentistry, and nursing students at Duy Tan University. However, the research still has some limitations. Firstly, the research was conducted in a short period of time, which may not fully represent the entire student population and could impact the longevity of perception scores. Second, this study is a cross-sectional study that cannot investigate the cause-and-effect relationships and changes in basic life support awareness over time. Further intervention studies should be conducted to evaluate more effective basic life support training methods for health science students.

CONCLUSION

The overall awareness of basic life support among medical, dentistry, and nursing students is still low. There is a relationship between basic life support awareness score and some demographic characteristics such as faculty, cumulative GPA, previous basic life support training participation, organization training courses, and voluntary engagement in basic life support activities ($p < 0.05$). To improve students' basic life support awareness, educational institutions can enhance training sessions organization, increase simulation practice opportunities, and regularly evaluate students' awareness and skills.

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