

# KNOWLEDGE, ATTITUDE AND PERCEPTIONS TOWARDS BASIC LIFE SUPPORT TRAINING AMONG STUDENT TEACHERS IN A MALAYSIAN UNIVERSITY



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## Abstract

Basic Life Support (BLS) training for school teachers is increasingly acknowledged as an important public health method to disseminate knowledge regarding life-saving skills such as CPR. However, there is a lack of studies examining this crucial area of training in Malaysia. Hence, this study aimed to investigate student teachers' knowledge, attitudes, and perceptions towards Basic Life Support training in a public university in Malaysia. An online questionnaire was implemented among final-year student teachers spanning seven different majors. Participants were required to answer 40 questions regarding their CPR knowledge, attitudes towards obtaining BLS training, and perceptions towards performing CPR. A total of 111 student teachers (80.2% female) responded to the survey. Results indicated that the majority of the participants (98.2%) would like to join a CPR training if offered. However, most participants reported a lack of information or resources in obtaining CPR training (82.0%) and had fears of incurring injury (93.7%), being sued (96.4%), being uncomfortable about bodily fluids (85.6%), or concerns of being infected with a communicable disease (85.6%) by the individual receiving CPR. Notably, knowledge regarding CPR was low regardless of CPR training history. Therefore, there is a need for public health information to be disseminated regarding CPR to dispel fears regarding its practice and provide future teachers opportunities to obtain BLS training.

*Keywords:* Basic Life Support, CPR, training, knowledge, attitude, student-teacher, Malaysia

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## 1. Introduction

To date, an estimated 17.5 million people have died each year from cardiovascular diseases (CVD) such as stroke and heart attack, known to be the world's leading cause of death (Field et al., 2010). Out of hospital cardiac arrests (OHCA) is a significant public health concern accounting for a substantial number of deaths worldwide. OHCA occurs in all groups, from adults to infants, comprising 70% of high mortality risk cases outside hospital settings (Dwood et al., 2014; Rajeswaran et al., 2018). As CPR is considered the second link in the chain of survival, it is highly recommended that this vital life-saving technique be taught and practiced worldwide as it improves the victim's survival rate when properly administered by a trained individual before the arrival of medical personnel (Hazinski et al., 2010; Nolan et al., 2010). A skilled individual's quick response could save a victim's life when performed accurately and effectively (Cuijpers et al., 2016; Plotnikoff & Moore, 1989).

The teaching of CPR, now extended to secondary school students, is being increasingly encouraged worldwide (Reder & Quan, 2003). As students are in school for a significant period of the day, basic CPR knowledge is essential (Olympia et al., 2005). These skills are now being taught as an optional component of the curriculum in primary and secondary schools in some countries (Adedamola & Chukwudi, 2018; Ghayeb et al., 2017). The guidelines of the International Liaison Committee on Resuscitation (ILCOR) by the American Academy of Paediatrics and American Heart Association (AHA) strongly recommends the inclusion of the BLS syllabus in the school curriculum (Adedamola & Chukwudi, 2018; Jain et al., 2016). The American Academy of Paediatrics and AHA have issued guidelines that stress the need for school teachers to be knowledgeable about emergency response measures to address life-threatening emergencies (Olympia et al., 2005). Thus, in this regard, the training of school teachers will facilitate the learning process for students.

School teachers form an integral part of our society, as they are responsible for educating future generations. Heightened awareness among school teachers will enhance their students' knowledge, which the students can share with their family, creating a ripple effect and increasing awareness in the community. In the long run, such educative processes can contribute significantly to an increase in the number of individuals trained to perform CPR when necessary (Adedamola & Chukwudi, 2018; Jain et al., 2016). Research has shown that school teachers are expected to play a vital role in performing CPR on students in any medical emergency. This means that teachers should acquire adequate knowledge and skills to provide effective resuscitation. Within the confines of the school, they are often the immediate individual on the scene to identify cardiac arrest in an individual (Zinckernagel et al., 2016). Malaysia has over 10,000 schools with an estimated 5 million students enrolled, including

420,000 teachers employed from pre-school to high school (Ministry of Education, n.d.). However, today's Malaysian school curriculum still lacks such topics, together with the resources to implement teaching ("Make emergency first aid a compulsory subject in schools," 2019).

Lukas et al. (2016) reported that teachers are as effective as physicians in teaching CPR to school children. Their study revealed that over 90% of school teachers who led the training had confidence in teaching their students. Some studies however, revealed that 50% of teachers were unwilling to teach CPR because they lacked knowledge (Mpotos et al., 2013) and CPR teaching skills (Tanaka et al., 2011). It is natural that teachers expect to be trained adequately in order to be able to teach students; however, teachers' actual CPR capacity has rarely been documented in the literature. Several international studies have reported on teachers' knowledge and attitudes regarding BLS and CPR practice in the school setting (Alharbi et al., 2016; Ghrayeb et al., 2017).

## **2. Purpose of the Study**

Due to the lack of data in non-Western settings, such as in Malaysia, this initial survey was conducted to determine the knowledge, attitude, and perceptions towards basic life support training among student teachers in a Malaysian university.

## **3. Research Questions**

The present study seeks to:

3.1 investigate the level of cardiopulmonary resuscitation (CPR) knowledge among student teachers from the Faculty of Education, Universiti Teknologi (MARA) Selangor.

3.2 investigate the attitude towards cardiopulmonary resuscitation (CPR) training among student teachers from the Faculty of Education, Universiti Teknologi (MARA) Selangor.

3.3 investigate the perception in rendering cardiopulmonary resuscitation (CPR) during medical emergency among student teachers from the Faculty of Education, Universiti Teknologi (MARA) Selangor.

## **4. Materials & Methods**

### *4.1. Research Design*

A cross-sectional quantitative survey design was employed involving final semester undergraduate student teachers across seven different majors from the Faculty of Education, Universiti Teknologi (MARA) Selangor.

### *4.2. Setting and Sample*

This study was conducted between December 1, 2020, and January 31, 2021, for a total of nine weeks. The samples were recruited from all undergraduate departments, using convenience sampling with 256 student teachers ranging from seven different majors enrolled in their final semesters. The inclusion criteria included being final semester undergraduate student teachers from all majors from the Faculty of Education of Universiti Teknologi MARA (UiTM) located in Selangor. The Faculty Ethical Committee reviewed and approved this study [UiTM/200-FP(PT.3/3)]. The questionnaire outline was described accordingly, and consent was acquired by submitting the online forms.

### *4.3. Data Collection Procedure*

Knowledge in CPR, attitudes, and perceptions towards BLS was assessed using an online platform via google form. With the Registrar's assistance, the questionnaire was distributed through an email invitation sent to all final semester student teachers. All students were given two weeks to complete the questionnaire. A reminder was set twice by the department coordinators to remind the students to submit the completed questionnaire.

### *4.4. Research Instruments*

The questionnaire comprised a total of 40 questions across three categories, including socio-demographics. Knowledge of CPR was obtained in a 20-item Multiple Choice Question section. The questions were based on the theory of the BLS Resuscitation Guidelines (Adult, Child & Infant) by the AHA and previously validated by selected professionals in terms of its face validity, construct, criterion, content validity, and tested in several studies for its reliability (Fariduddin et al., 2018; 2019; 2020). A passing mark of 84% (16 out of 20) for the MCQ was adopted in this study, consistent with the official AHA guidelines. One mark was awarded for each correct answer, while no penalty was given for incorrect answers. Attitude and perception were assessed using a dichotomous scale, comprising 12 items. This set of items was adopted and adapted from Pivac et al. (2020) and Ojifinni et al. (2019). The content and face validity

for both instruments were previously established, with an internal consistency reliability of Cronbach's alpha 0.81 (Pivac et al., 2020) and 0.72 (Ojifinni et al., 2019) respectively.

#### 4.5. Data Analysis

All data collected from the returned questionnaires were extracted and imported into IBM SPSS Version 27 software for analysis. The demographic information was reviewed, organized, tabulated, and statistically analyzed using descriptive statistics and the CPR knowledge test scores. A chi-square test of contingencies was used to analyze the association between the last CPR certification and CPR knowledge scores.

## 5. Results

**Table 1.** Respondents' demographic characteristics

Demographics	Descriptions	n (%)
Gender	Male	22 (19.8)
	Female	89 (80.2)
Age	19-21	1(0.9)
	22-24	55 (49.5)
	> 25	55 (49.5)
Highest Level of Education	STPM <sup>1</sup> /Matriculation	14 (12.6)
	Diploma	97 (87.4)
Course Information	TESL <sup>2</sup>	38 (34.2)
	Physics Education	7 (6.3)
	Chemistry Education	11 (9.9)
	Biology Education	20 (18.0)
	Mathematics	5 (4.5)
	Physical & Health	15 (13.5)
	Art Education	15 (13.5)
Experienced Dealing with Emergencies	Yes	35 (31.5)
	No	76 (68.5)
Attended the First Aid Course for the past five years	Yes	53 (47.7)
	No	58 (52.3)
Last CPR Course Certification	< 6 months	56 (50.5)
	7 – 12 months	4 (3.6)
	> 1 year	51 (45.9)
Source of CPR Training	Healthcare	5 (4.5)
	Professionals	21 (18.9)
	Lectures	7 (6.3)
	NGO's	17 (15.3)
	Internet/Television	28 (25.2)
	Co-curriculum	33 (29.7)
	Activities	
Multiple Sources		

<sup>1</sup>STPM is the Malaysian version of Higher School Certificate A levels.

<sup>2</sup> Teaching of English as a Second Language

Out of 256 questionnaires distributed through an online platform (Table 1), a total of 111 were returned and analyzed, with a response rate of 43.4%. Most respondents were female (n = 89; 80.2%), with 22 (19.8%) males. There were three age categories, with 1 (0.9%) respondent aged between 19-21 and 110 (99%) respondents aged between 22-24 (n = 55; 49.5%) and above 25 (n = 55; 49.5%). Most respondents had a diploma (n = 97; 87.4%), and 14 (12.6%) were STPM/ Matriculation holders. The majority of respondents were 38 (34.2%) from TESL, 7 (6.3%) from Physics, 11 (9.9%) from Chemistry, 20 (18%) from Biology, 5 (4.5%) from Mathematics, and 15 (13.5%) each from Physical & Health and Art Education respectively.

As for CPR background, 76 (68.5%) had not handled any medical emergencies before, with 58 (52.3%) had never attended any CPR-related course for the past five years. However, 56 (50.5%) obtained their recent CPR certification in less than six months, followed by 4 (3.6%) within 7-12 months, and 51 (45.9%) obtained their certification more than a year ago. All respondents acquired their training either through multiple sources (n = 33; 29.7%), co-curriculum activities (n = 28; 25.2%), internet (n = 17; 15.3%), lectures (n = 21; 18.9%), NGOs (n = 7; 6.3%) and healthcare professionals (n = 5; 4.5%).

**Table 2.** Respondents' Basic Life Support (BLS) knowledge scores

Variables	Scoring	N (%)
BLS Knowledge	Pass	0 (0)
	Fail	111 (100)
	Mean	S.D
	6.59	2.21

The first part of the questionnaire examined the level of BLS knowledge among all student teachers. The mean knowledge scores were  $6.59 \pm 2.21$  out of a maximum of 20 points. None of the students passed the knowledge test. Notably, a Pearson chi-square test of contingencies used to examine the association between BLS scoring status (PASS/FAIL) and last CPR course certification alarmingly found that the failing rate of all students indicates no significant association towards the previous CPR certification despite more than half of the respondents having reported that they had acquired a recent CPR certification in the last six months (Table 2).

**Table 3.** Respondents' attitude and perceptions towards Basic Life Support (BLS)

Variables	Descriptions	N (%)
Ever received formal CPR training	Yes	45 (40.5)
	No	66 (59.5)
Reasons for not receiving any CPR training	Not a healthcare professional	9 (8.1)
	I never thought of it	10 (9.0)
	Costly	1 (0.9)
	No information or resources to join	91 (82.0)
I would like to join CPR training as part of teachers' training	Yes	109 (98.2)
	No	2 (1.8)
Rendered medical emergencies	Yes	18 (16.2)
	No	93 (83.8)
Willingness to provide CPR before training	Yes	29 (26.1)
	No	82 (73.9)
Willingness to provide CPR after training	Yes	90 (81.1)
	No	21 (18.9)
Need to make CPR training mandatory for school teachers	Yes	105 (94.6)
	No	6 (5.4)
CPR training would create extra demand for curriculum	Yes	62 (55.9)
	No	49 (44.1)
Fear of being sued as a barrier to performing CPR	Yes	107 (96.4)
	No	4 (3.6)
Fear of body fluids being passed as a barrier for performing CPR	Yes	95 (85.6)
	No	16 (14.4)
Fear of causing injury as a barrier for performing CPR	Yes	104 (93.7)
	No	7 (6.3)
Contracting diseases as a barrier for performing CPR	Yes	95 (85.6)
	No	16 (14.4)

The final part of the questionnaire examined the attitudes and perceptions toward BLS. More than half (59.5%) of the respondents stated that they had not received any formal CPR training previously. Having no information or resources to join CPR training was the most frequently reported reason (82%) for not being trained. However, most of the respondents did indicate their interest to join the formal CPR training as part of the teachers' training program (98.2%) if they were allowed to do so. Besides that, 83.8% of the respondents had never experienced handling or rendering help during any medical emergencies, leading to their unwillingness to provide CPR before receiving any formal training (73.9%). Nevertheless, this trend is largely reversed (81.1%) as the respondents stated that they would be willing if they had received the proper training. In terms of their perceptions, nearly all the respondents agreed that the CPR training should be mandatory in teachers training programs across Malaysia (94.6%). However, these respondents were divided in their perceptions as to whether the training might (55.9%) or might not (44.1%) be an added burden if it were to be implemented

as part of the curriculum. Lastly, in providing CPR during emergencies, the majority of the respondents agreed that barriers such as being sued for negligence (96.4%), exposure to body fluids (85.6%), causing injury to the victim (93.7%), and contracting diseases (85.6%) were among the main reasons for their unwillingness to not perform CPR during medical emergencies.

## **6. Discussion**

CPR knowledge, attitude, and perceptions towards performing BLS during medical emergencies among final year student teachers from various majors in a Malaysian university were investigated. Overall, this study illustrates the alarming trend of low scores in CPR general knowledge despite experiencing training from multiple sources among the final year student teachers. This finding indicates that all student teachers sampled had a low level of knowledge in CPR with zero passes on the knowledge assessment, as reflected in Table 2 with an average score ranging from 4 to 8, which merely reached the standard passing rate in the AHA guidelines (Hazinski et al., 2010). Although there was no significant association between past CPR certification and knowledge, these results reveal that despite the recent certification of less than six months, all student teachers failed to retain their knowledge, resulting in failing the knowledge test. The result was consistent with other studies showing that, generally, school teachers do not have adequate CPR knowledge (Alharbi et al., 2016; Yang & Kwon, 2014). This result is also directly related to the absence of previous exposure to any related medical emergencies or ever handling any medical emergencies. As a result, such minimal to no exposure to medical emergencies could lead to limited knowledge and subsequently increases the chances of knowledge deterioration (Al Enizi et al., 2016; Lockey et al., 2016) through a lack of practice.

Retention also plays a role in maintaining adequate knowledge over time. For instance, in this study, nearly half of the student teachers had attended CPR courses in the past five years, and more than half of them acquired their recent certification in less than six months. Nevertheless, research has shown that knowledge loss over time varies according to the nature of the job and professions. For instance, several studies show that healthcare workers' knowledge and skills decrease following three months after training (Bukiran et al., 2014; Ouseph et al., 2015). Alarmingly, despite handling emergencies related to CPR daily, knowledge deterioration still occurs. Like the trend among professionals, this is reflected in the student teachers sampled in this study as they too seemed to experience a high declining rate of knowledge, indicating low retention despite recent CPR certification. This trend was also mirrored in a study conducted among student teachers in Pakistan, which documented a



low retention rate at two months following CPR training (Naqvi et al., 2011). This highlights the ongoing need to determine a suitable duration for CPR training, the number of refresher courses required within a stipulated time to prevent knowledge decay, types of training, and resources to provide the appropriate training based on the standard BLS guidelines.

The second part of this study focused on the attitude and perceptions of the respondents toward BLS training. As reflected in Table 3, more than half had not attended any formal CPR training. The most frequently cited reason for not doing so was the lack of information on formal CPR training instead of financial difficulties and other reasons. In the school setting, most CPR training was conducted by personnel from different vocations, such as firefighters and healthcare professionals (Chien et al., 2016). As stated earlier, the guidelines of the International Liaison Committee on Resuscitation (ILCOR) by the American Academy of Paediatrics and American Heart Association (AHA) strongly recommend the inclusion of the BLS syllabus in the school curriculum (Adedamola & Chukwudi, 2018). Research has shown that in any medical emergency, it is expected for school teachers to be involved primarily in performing effective CPR on students. In this study, the respondents' attitudes towards providing CPR during emergencies reveal that the majority are unwilling to provide CPR before receiving any training. While this is understandable, this trend is reversed as with increased CPR knowledge, they displayed greater willingness and confidence to help others during medical emergencies (Chien et al., 2016; Naqvi et al., 2011). This shows that teachers should acquire adequate knowledge and skills in BLS enabling them to provide effective resuscitation to victims during emergencies in school before the arrival of medical personnel. They are often the first individuals in school to be able to identify cardiac arrest and perform the necessary interventions to save the victim's life (Zinckernagel et al., 2017).

Considering the importance of such lifesaving knowledge and skills for teachers, it is no longer a question of whether to make BLS a mandatory part of the teacher training curriculum, but how soon it can be done. Some teacher training programs, such as Physical and Health Education, have been integrating several subjects such as basic first aid and injury prevention with BLS short courses. To ensure these courses' efficacy, the program utilizes several up-to-date teaching and learning techniques such as using Quality-CPR (QCPR) manikins with simulation and debriefing to allow students to experience real-time medical emergencies (Fariduddin & Mohd Johar, 2021; Tanaka et al., 2020). With experts' presence as part of the faculty and the resources to implement it, it is imperative that all education courses are restructured to include these courses as mandatory for all final year student teachers across all programs. Despite their perception that this addition would be a burden on the curriculum,

the need for teachers to be proficient in life saving techniques outweighs their hesitation. This highlights the need to restructure the teacher training curriculum.

In any medical emergency in a school setting, it is expected for school teachers to render CPR effectively; nevertheless, the willingness to perform CPR remains questionable and often attributed to various perceived barriers by laypersons in initiating CPR (Bradley & Rea, 2011). In this study, the fear of medical error and causing injury was the highest underlying the unwillingness to perform CPR during medical emergencies. This fear is understandable as most student teachers had minimal understanding and experiences, as depicted in this study's results. Not knowing the proper techniques would lead to errors in doing chest compression or providing rescue breathing, lack of experiences handling medical emergencies, flawed theories, and lack of practices are significant attributes affecting their confidence and subsequently creating the fear of medical negligence (Kuah, 2011). However, most laypeople are unaware that internationally, performing CPR falls under the Good Samaritan law that protects a layperson (American Heart Association, 2006; Kuah, 2011) from legal repercussions. At the very least, performing CPR even flawed, may likely increase the chances of out of hospital survival rather than not performing CPR at all which will lead to certain death. This study also reported fear of contracting diseases and exposure to body fluids as other barriers for the unwillingness to perform CPR. This may be related to socio-religious and/or socio-cultural inhibitions among Asians in general to physical contact with strangers. This can be related to a study conducted in the United Kingdom, where more than 80% were willing to initiate CPR on a stranger but the initiation was hindered due to the presence of facial bleeding (Lester et al., 2000). This trend and perception of most student teachers in this study reflects the lack of in-depth understanding of performing CPR. In the chain of survival, it is crucial to ensure the performer's safety before rendering CPR to the victim; however, the AHA guidelines also suggest compression-only CPR as an alternative in performing CPR (Hazinski et al., 2010; Nolan et al., 2010). This method focuses on using hands only with no contact on the victim's mouth to deliver rescue breathing, hence, minimizing exposure to contracting diseases and body fluids.

## **7. Conclusion and Implications**

This study found that while the knowledge of teacher trainees regarding CPR is very poor, their attitude towards obtaining CPR training was positive, with a large majority agreeing to join a training if available and believing that CPR should be mandatory for school teachers. Therefore, perceived barriers raised in this study such as not having information regarding available training opportunities and fears of causing injury to others or being sued can be

eliminated by disseminating correct public health information regarding CPR through the training modules. There is an urgent need to get Malaysian teacher trainees trained in CPR to ensure their readiness in case of medical emergencies in schools. In fact, teachers who are trained can also be certified to conduct trainings for the school students which is in line with the growing global trend of increasing CPR bystanders' population in reducing the out-of-hospital death due to sudden cardiac arrest.

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