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Knowledge, Attitude, and Practice of Basic Life Support (BLS) among the Students of Quest International University: A Cross-Sectional Study from Ipoh, Perak, Malaysia

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ABSTRACT

Introduction:
Basic Life Support (BLS) is a fundamental component of emergency medical care for maintaining airway patency, supporting ventilation, and preserving circulation during respiratory or cardiac arrest. Poor survival rates are strongly associated with delays in recognition of symptoms, low-quality CPR and defibrillation, showing the urgency of early intervention at the community and healthcare-provider levels. The present study aimed to evaluate students' knowledge, attitudes, and practices related to Basic Life Support, to identify gaps to strengthen BLS education and training.

Methods:
This cross-sectional descriptive study was conducted from January 2025 to May 2025. A structured questionnaire was distributed online via Google Forms, where 179 respondents participated.

Results:
Females had a higher proportion of fair knowledge than males. Ethnicity and religion showed significant associations with attitude level. Nationality and ethnicity were significantly associated with practice level, with Malaysian participants and certain ethnic groups demonstrating better practice patterns.

Conclusion:
The present study highlights important knowledge and practical application gaps in Basic Life Support (BLS), despite participants' overall positive attitude. The predominance of poor-to-fair knowledge levels and suboptimal practice patterns underscores a critical disconnect between awareness and competency.

Keywords
Cardiac failure, emergency, knowledge, respiratory failure, training,

Introduction

Basic Life Support (BLS) is a fundamental component of emergency medical care for maintaining airway patency, supporting ventilation, and preserving circulation during respiratory or cardiac arrest. Early initiation of BLS plays a vital role in preventing irreversible organ damage, particularly brain damage due to hypoxia. The American Heart Association (AHA) has established evidence-based guidelines for early recognition of sudden cardiac arrest (SCA), prompt activation of emergency medical services (EMS), initiation of high-quality cardiopulmonary resuscitation (CPR), and early defibrillation with an automated external defibrillator (AED) when indicated. Chest compressions and ventilation can deliver approximately a third of the normal cardiac output, thereby maintaining cerebral and coronary perfusion until paramedics arrive. Timely and high-quality CPR is directly linked to high survival rates and positive neurological outcomes in cardiac arrest situations. [1, 2]

Sudden cardiac death (SCD) is still a persistent public health challenge globally and has been attributed to increased mortality. Despite advances in emergency medical services that have improved outcomes in high-income nations, survival rates for out-of-hospital cardiac arrest patients remain suboptimal, particularly in developing countries that have poor accessibility to emergency care. Epidemiological studies prove that coronary artery disease is one of the major causes of SCD in adults, often occurring without prior symptoms. [3, 4]

Poor survival rates are strongly associated with delays in recognizing symptoms and with low-quality CPR and defibrillation, underscoring the urgency of early intervention at the community and healthcare-provider levels. [5] Healthcare workers are expected to possess optimal knowledge and skills in BLS, as they are often the first responders to cardiac arrest events in both in- and out-of-hospital settings. The prognosis following cardiac arrest positively correlates with the timeliness and quality of CPR provided and with rapid access to defibrillation. Furthermore, regular BLS training and certification are essential to maintain competency and knowledge of current protocols. Notwithstanding, CPR recommendations are regularly revised and updated based on emerging evidence, underscoring the need for continuous education and refresher training. Studies demonstrate that without consistent reinforcement, both knowledge and psychomotor skills related to CPR diminish markedly over time. [6-8]

Despite the importance of BLS training, researchers have reported deficits in knowledge, attitude, and practical competence among medical students, interns, and residents. Suboptimal training or a lack of confidence in performing CPR can negatively impact patient outcomes and leave healthcare providers vulnerable to medico-legal consequences. Since interns and junior doctors are often the first point of contact in emergencies, evaluating their readiness to perform BLS effectively is paramount. Therefore, the present study was undertaken to assess knowledge, attitudes, and practices related to Basic Life Support among undergraduate students, identify gaps, and inform strategies to strengthen BLS education and training.

Methods

Study period, study design, and participants

This cross-sectional descriptive study was conducted from January 2025 to May 2025. A structured questionnaire was distributed online via Google Forms, with 179 participants responding.

Study participants

Medical, biomedical, and pharmacy students from Quest International University aged 18 and above who were willing to participate, provided informed consent, and were included in this research.

Collection of data and a questionnaire

The respondents answered the questionnaire via Google Forms. The questionnaire consists of two sections. Section one presents the demographic profile of the respondents, including age, gender, nationality, and ethnicity. Section two was the Adult Basic Life Support Knowledge Questionnaire (AHA BLS). 30 questions based on AHA BLS 2020 used to evaluate the knowledge, attitudes, and practices of BLS as follows: a) knowledge – 13 items, b) attitude – 7 items, and c) practice – 10 items. [9]

Independent variables

Age, gender, ethnicity, nationality, ethnicity, and religion were considered independent variables.

Dependent variables

Knowledge, attitude, and practice of BLS.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS, version 26) was used for the statistical analysis. Descriptive statistics was performed to summarise the data. Meanwhile Pearson's chi-square test and Fisher's exact were performed to infer the result to the study population. The p-value < 0.05 was set as the cut off for statistical significance.

Ethical committee approval

The authors obtained permission from the Joint Research Ethics Committee (JREC) before commencing the study. Unique identifiers, such as names, addresses, email addresses, or phone numbers, were not collected to maintain confidentiality. Informed consent was also obtained to ensure voluntary participation in this study. Participants were clearly informed about the purpose of the study. They were assured that refusal to participate or withdrawal from the study at any point would not result in any penalty or adverse consequences.

Results

Table 1: Descriptive statistics of demographic profile (n = 179)

Variable	n	(%)
Age (in years)		
18-20	79	(44.1)
21-23	70	(39.1)
24 and above	30	(16.8)
Gender		
Male	72	(40.2)
Female	107	(59.8)
Nationality		
Malaysian	112	(62.6)
Non-Malaysian	67	(37.4)
Ethnicity		
Indian	89	(49.7)
Chinese	24	(13.4)
Malay	2	(1.1)
Others	64	(35.8)
Religion		
Hinduism	79	(44.1)
Christianity	28	(15.6)
Islam	33	(18.4)
Buddhism	29	(16.2)
Others	10	(5.6)

Table 1 explains that among the 179 participants, most were aged 18–20 years (44.1%), followed by those aged 21–23 years (39.1%). Females constituted a higher proportion of the sample (59.8%) compared to males (40.2%). The majority were Malaysian nationals (62.6%). Indian ethnicity was the most common (49.7%), followed by others (35.8%). Hinduism was the predominant religion (44.1%), with representation from Islam, Buddhism, Christianity, and other religions.

Table 2 shows that the majority of participants demonstrated poor to fair knowledge, with only a small proportion exhibiting good knowledge. Gender was the only socio-demographic variable significantly associated with knowledge level, with females showing a higher proportion of fair knowledge compared to males (χ^2=8.787, p=0.012). No statistically significant associations were observed between knowledge level and age, nationality, ethnicity, or religion (p>0.05).

Table 2: Association between socio-demographic variables and Knowledge level (n=179)

Variable	Poor (n)	Fair (n)	Good (n)	χ^2(df)	P value
Age (in years)					0.16[a]
18–20	34 (19.0)	38 (21.2)	7 (3.9)		
21–23	22 (12.3)	45 (25.1)	3 (1.7)		
24 and above	12 (6.7)	18 (10.1)	0 (0.0)		
Gender				8.787 (2)	0.012[b]
Male	36 (20.1)	31 (17.3)	5 (2.8)		
Female	32 (17.9)	70 (39.1)	5 (2.8)		
Nationality					0.179[a]
Malaysian	42 (23.5)	61 (34.1)	9 (5.0)		
Non-Malaysian	26 (14.5)	40 (22.3)	1 (0.6)		
Ethnicity					0.072[a]
Indian	32 (17.9)	48 (26.8)	9 (5.0)		
Chinese	7 (3.9)	17 (9.5)	0 (0.0)		
Malay	2 (1.1)	0 (0.0)	0 (0.0)		
Others	27 (35.8)	36 (20.1)	1 (0.6)		
Religion					0.144[a]
Hinduism	29 (16.2)	41 (22.9)	9 (5.0)		
Christianity	14 (7.8)	14 (7.8)	0 (0.0)		
Islam	10 (5.6)	23 (12.8)	0 (0.0)		
Buddhism	11 (6.1)	17 (9.5)	1 (0.6)		
Others	4 (2.2)	6 (3.4)	0 (0.0)		

[a] *Fisher's exact test,* [b] *Pearson's chi square test*

Table 3: Association between socio-demographic variables and Attitude level (n=179)

Variable	Poor (n)	Good (n)	χ^2(df)	P value
Age (in years)			3.747 (2)	0.154
18–20	18 (10.1)	61 (34.1)		
21–23	14 (7.8)	56 (31.3)		
24 and above	2 (1.1)	28 (15.6)		
Gender				0.093[a]
Male	18 (10.1)	54 (30.2)		

Female	16 (8.9)	91 (50.8)		
Nationality			3.463 (1)	0.063[b]
Malaysian	26 (14.5)	86 (48.0)		
Non-Malaysian	8 (4.5)	59 (33.0)		
Ethnicity				0.004[a]
Indian	14 (7.8)	75 (41.9)		
Chinese	11 (6.1)	13 (7.3)		
Malay	0 (0.0)	2 (1.1)		
Others	9 (5.0)	55 (30.7)		
Religion				<0.001[a]
Hinduism	11 (6.1)	68 (38.0)		
Christianity	7 (3.9)	21 (11.7)		
Islam	2 (1.1)	31 (17.3)		
Buddhism	13 (7.3)	16 (8.9)		
Others	1 (0.6)	9 (5.0)		

[a] *Fisher's exact test*

Table 3 shows that overall, most participants displayed a good attitude. Ethnicity and religion showed significant associations with attitude level, with differences observed across ethnic groups (*p=0.004)* and religious affiliations (*p<0.001*). Age, gender, and nationality were not significantly associated with attitude level (p>0.05).

Table 4: Association between socio-demographic variables and Practice level (n=179)

Age (in years)	Category	Poor (n)	Fair (n)	Good (n)	χ^2(df)	P-value
	18–20	45 (25.1)	17 (9.5)	17 (9.5)	8.157 (4)	0.086[b]
	21–23	29 (16.2)	20 (11.2)	21 (11.7)		
	24 and above	10 (5.6)	13 (7.3)	7 (3.9)		
Gender						
	Male	39 (21.8)	18 (10.1)	15 (8.4)	2.605 (2)	0.272[b]
	Female	45 (25.1)	32 (17.9)	30 (16.8)		
Nationality						
	Malaysian	54 (30.2)	23 (12.8)	35 (19.6)	10.411 (2)	0.005[b]
	Non-Malaysian	30 (16.8)	27 (15.1)	10 (5.6)		
Ethnicity						
	Indian	36 (20.1)	25 (14.0)	28 (15.6)	13.800 (6)	0.032[b]
	Chinese	14 (7.8)	2 (1.1)	8 (4.5)		
	Malay	2 (1.1)	0 (0.0)	0 (0.0)		
	Others	32 (17.9)	23 (12.8)	9 (5.0)		
Religion						
	Hinduism	35 (19.6)	18 (10.1)	26 (14.5)		0.230[a]
	Christianity	15 (8.4)	9 (5.0)	4 (2.2)		
	Islam	13 (7.3)	14 (7.8)	6 (3.4)		
	Buddhism	14 (7.8)	7 (3.9)	8 (4.5)		
	Others	7 (3.9)	2 (1.1)	1 (0.6)		

[a] *Fisher's exact test,* [b] *Pearson's chi square test*

Table 4 explains that practice levels varied across participants, with a considerable proportion reporting poor practice. Nationality and ethnicity were significantly associated with practice level, with Malaysian participants and certain ethnic groups demonstrating better practice patterns (nationality: $\chi^2=10.411$, $p=0.005$; ethnicity: $\chi^2=13.800$, $p=0.032$). No significant associations were found between practice level and age, gender, or religion (p>0.05).

Discussion

The demographic profile of participants in the present study indicates a predominance of female students. Previous studies suggest that younger participants may have limited exposure to real-life emergencies, which could influence their experiential learning and practical competence despite theoretical instruction. Additionally, the higher proportion of female participants reflects trends observed in allied health and medical education settings. These trends may have implications for the knowledge and attitude patterns reported in BLS-related research. Similar demographic trends have been reported in studies conducted among medical and nursing students in Asia and the Middle East. [10-12]

Analysis of the association between sociodemographic variables and knowledge level revealed that most participants had poor to fair knowledge, with only a small fraction achieving good knowledge scores. Notably, gender was the only variable significantly associated with knowledge level, with females showing a higher proportion of fair knowledge than males. This finding aligns with earlier research indicating that female students often demonstrate better theoretical awareness and compliance with learning outcomes in health-related subjects. [13] A researcher from Jizan conducted a study of university students and found that both male and female participants had average BLS knowledge, with male students having higher attitude scores. [14]

The lack of significant associations between knowledge and age, nationality, ethnicity, or religion suggests that deficiencies in BLS knowledge may be systemic rather than confined to specific demographic groups. Similar studies conducted among undergraduate medical students and interns have shown inadequate BLS knowledge across multiple demographic groups, further supporting the view that these shortcomings stem from formal training rather than individual factors. [15, 16] These results reiterate the cruciality of structured and standardized BLS education instead of dependence on informal or incidental learning.

Contrary to knowledge levels, participants demonstrated a positive attitude toward BLS, with most scoring high. Notable associations were observed between attitude score and both ethnicity and religion, indicating a sociocultural role in perceptions of emergency care and life-saving interventions. Cultural values, religious beliefs, and societal norms have been shown to influence willingness to perform CPR, especially in instances involving physical contact or mouth-to-mouth ventilation. [17, 18]

The absence of significant correlations between attitude and age, gender, or nationality is consistent with earlier studies showing generally positive attitudes toward BLS among students, regardless of their demographic background. [19] Importantly, the coexistence of positive attitudes with limited knowledge indicates a significant disconnect, suggesting that while participants are cognisant of the importance of BLS, they may lack the necessary skills to act effectively in emergencies.

Regarding practice scores, the findings reveal substantial variability, with a large proportion of participants reporting poor practice. Nationality and ethnicity were significantly associated with practice performance, with Malaysian participants achieving relatively higher scores. This could be attributed to differences in engagement with structured training programs, curricular focus, or access to BLS workshops and simulation sessions. Prior studies have shown that individuals who receive formal hands-on or simulation-based training demonstrate noticeably better practical performance and greater confidence in BLS skills. [6, 7]

The lack of substantial associations between practice level and age, gender, or religion reflects the view that training opportunities rather than demographic factors primarily shape practical capability. The gap between attitude and practice is a consistent finding in BLS research and underscores the inadequacy of theoretical learning alone in preparing individuals for real-life emergency response.

Overall, this study's findings align with a consistent global pattern: positive attitudes toward BLS coexist with limited knowledge and practical incompetence. This discrepancy may have implications for patient safety and emergency readiness, especially in healthcare and educational settings where early intervention can save lives. The significant associations identified with gender (knowledge), ethnicity and religion (attitude), and nationality and ethnicity (practice) indicate that although demographic factors may influence specific domains, BLS training programs are beneficial for closing gaps across all groups. Implementing mandatory, skill-based BLS training with periodic refresher courses integrated into the curriculum may greatly improve knowledge retention and psychomotor skills, ultimately strengthening emergency response capacity. [1, 2]

Conclusion

The present study highlights important knowledge and practical application gaps in Basic Life Support (BLS), despite participants' overall positive attitude. While most respondents demonstrated favorable perceptions toward the importance of BLS, the predominance of poor to fair knowledge levels and suboptimal practice patterns underscores a critical disconnect between awareness and competency.

Limitations and future scope

The sample size of this study was small, so a broader study with a larger cohort is strongly recommended.

Abbreviations

Basic life support (BLS)

Relevance of the study

These findings show the need for structured, competency-based BLS training programs integrated into undergraduate curricula, with a strong focus on hands-on practice, simulation, and periodic refresher courses, which will benefit healthcare and the community.

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Authors' contribution

All authors made equal contributions to the study in terms of planning, data collecting, data analysis/interpretation, paper writing, manuscript revision, and final approval of the manuscript. All authors also agreed to be responsible for all parts of the work.

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Availability of data and materials

All data underlying the results is available as part of the article, and no additional source data is required.

Competing interests

None declared.

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