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KNOWLEDGE AND AWARENESS OF SAUDI MEDICAL STUDENTS TOWARDS BLS

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Abstract

Background: Basic life support (BLS) is a crucial component of emergency resuscitation care that can save lives in cases of sudden cardiac arrest, heart attack, stroke, or foreign body airway obstruction. The effectiveness of cardiopulmonary resuscitation (CPR) has been linked to improved quality of life, increased neurological recovery, and a patient's ability to return to work after sudden cardiac arrest (SCA). However, there are differences in sudden cardiac arrest survival rates across regions, partially influenced by the time delay between cardiac arrest and the initiation of chest compressions. This study aims to assess the knowledge and awareness level of basic life support among Saudi medical students.

Methods: This was a cross-sectional study conducted in Saudi Arabia from 2024 to 2025. The study population consisted of male and female Saudi medical students enrolled in public and private universities, aged eighteen and above. A sample size of 380 participants was calculated using the Raosoft sample size calculator. Data was collected using a questionnaire and analyzed using SPSS software version 25.

Results: Regarding the knowledge and awareness of BLS, there was a generally positive recognition of BLS, with 89.6% (N 752) identifying it correctly. However, there were significant gaps in immediate response actions, as only 6.9% would initiate chest compressions upon encountering an unresponsive individual. Knowledge of CPR metrics was variable; while 65.7% accurately identified the ideal chest compression rate, only 31.9% recognized the abbreviation for Automated External Defibrillator (AED). Alarmingly, only 10.1% exhibited high knowledge levels, with 54% classified as low in BLS understanding. The study also found significant correlations between BLS knowledge and factors such as gender, age, nationality, academic level, and GPA, but no significant relationship with residential area.

Conclusion: In conclusion, this study highlights a concerning gap in the knowledge and awareness of BLS among Saudi medical students. While some understanding exists, a significant portion

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demonstrated insufficient knowledge necessary for effective emergency response. Addressing these deficiencies through enhanced training programs is crucial to improving survival outcomes in cardiac emergencies.

Keywords: Basic life support, CPR, Knowledge, Awareness, Medical students, Saudi Arabia.

Introduction:
When someone exhibits symptoms of sudden cardiac arrest, heart attack, stroke, or foreign body airway obstruction, basic life support (BLS), which maintains adequate respiration and circulation, is a crucial component of emergency resuscitation care that saves their lives [1]. One of the most frequent kinds of life-threatening emergencies and a major global cause of death is sudden cardiac arrest [2]. The effectiveness of CPR has been linked to a better quality of life, an increased rate of neurological recovery, and a patient's ability to return to work after suffering a sudden cardiac arrest (SCA) [3]. There are differences in the survival rates of sudden cardiac arrest in several regions, which is one of the main causes of mortality globally [4]. Cardiac arrest prognosis is significantly influenced by the time delay between cardiac arrest (CA) and the start of chest compressions [5]. A Similar previous study was published in 2023, with a sample size of 1692 Saudi students showed that 95.3% had positive attitude. Also, that 54% had moderate knowledge score, 35.1% had excellent scores, and 10.9% with low scores which was clearly affected by age and academic year of participants [6]. In another study published 2022 with 300 participants from 1st and 2nd year of medical school showed that 76.4% and 81.1% got moderate scores, 17.6% and 14.2% got good scores, only 5.4% and 4.7% got low scores [7]. In also a similar study conducted in Oman and published in 2020 with a sample size of 304 showed that the mean knowledge was high (5.5 ± 2.1), a median of 5 and 53.6% with poor knowledge, and as shown in previous studies it got better with later years in medical school, as for attitude 74% didn't refuse to do BLS on a stranger, but higher refusal rates were noted in female students with comparison to male students, 40.5% were male and 59.5% were female [8]. Few studies have been conducted in our area, as far as we know, to assess medical students' awareness and competence of basic life support. Basic life support is significant and medical students have relatively little awareness of it.

Main objective:
The main objective of our study is to assess the knowledge and awareness level of basic life support among Saudi medical students.

Specific objectives:
Ability to do an overall evaluation of victims who lose their consciousness, to identifying components of emergency resuscitation and deal with it differently with adult and pediatric cases, willingness to preform CPR and knowing its appropriate method, ability to use an automated external defibrillator (AED).

Materials and Methods:

Study design and Setting:
This was a cross-sectional study conducted in the period from July - November 2024 in Saudi Arabia. The study's population consisted of Saudi Arabian private and public university-enrolled male and female medical students who were at least eighteen years old. The participants were recruited from various regions of the country. The sample consisted of both male and female students.

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Sample size:
The Sample size was calculated using (Raosoft, Inc., Seattle, WA, USA) at 377 but rounded to 380 for even calculations after that, using this formula. $n = (z)^2 p (1 – p) / d^2$. N= sample size. Z= 1.96 standard deviation for 95% CI. p= 50% d= 5%

Inclusion and Exclusion criteria:
Inclusion criteria: included all undergraduate Male and Female medical students in Saudi Arabia universities.
Exclusion criteria: Physicians, graduated students, medical interns, and non-medical students were all excluded.

Method for data collection and instrument (Data collection Technique and Tools):
In this study, Saudi Arabian medical students' knowledge of basic life support was assessed using a standardized questionnaire. This instrument is connected to a previous study that was used in this online questionnaire[9]. 26 questions are divided into 3 sections of this instrument. The goal of the research study with informed permission is presented in the first section. Six questions regarding social and demographic information about the participants such as: gender, nationality, place of residence, academic year, university, and academic level are included in the second section. The third section is the main section of the study includes a sequence of multiple-choice questions designed to assess participants' understanding of basic life support (BLS). Twenty questions cover topics such as what BLS stands for, what it includes, and the proper first response one should give in an emergency. The appropriate way to perform chest compressions during CPR, the immediate action to take when encountering an unconscious person and other basic BLS techniques and procedures.
Scoring system:
In all, 26 statements served to assess the participants' attitudes and degree of knowledge. 6 statements for demographics, 20 for knowledge. One point is given for correct answers, and zero points are given for incorrect answers. For scoring, we utilized (Multiple choice questions) The maximum score was 20 and divided as follows: The original Bloom's cut-off points, 80.0%-100.0%, 60.0%-79%, and 59.0%, The participants will be divided into three groups based on their scores. knowledge score varied from 0 to 20 points and was classified into three levels as follows: those with a score of 10 or below (≤ 11) were classified as having a **low level of knowledge**, those with scores between 12 and 15 as having a **moderate level of knowledge**, and those with scores 16 or above (≥ 16) as a **high level of knowledge.**

Pilot test:
The questionnaire was pre-tested by being distributed to 20 study participants. This was done to determine acceptability and clarity of the questions and to confirm its face validity and what are their comments about it. Data of the pilot study was excluded from the final data of the study.

Analyzes and entry method:
The collected data was inputted into a Microsoft Excel program (2016 version) on a computer running the Windows operating system. This data was subsequently transferred to the SPSS (Statistical Package for the Social Sciences) software, version 20, in order to perform statistical analysis.

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Results:

Table (1) displays various demographic parameters of the participants with a total number of (752). A notable finding is the predominance of younger participants, with the majority aged between 20 and 23 years, highlighting a youthful demographic engaging in the study. Gender distribution reveals a significant tilt towards females, who comprise 66% of the sample, indicating potential gender-based trends in the studied population. The overwhelming majority identify as Saudi nationals (97.3%), suggesting a homogenous cultural context. Geographically, participants are primarily located in the Western region (51.3%), which may reflect urbanization patterns or accessibility to educational institutions. The academic year distribution shows a robust representation of students in their fourth and fifth years, correlating with an increased focus on specialized medical training. Regarding academic performance, a striking 54.5% of participants have achieved an "Excellent" GPA, underscoring a strong academic commitment within this study.

Table (1): Sociodemographic characteristics of participants (n=752)

Parameter		***No.***	***Percent (%)***
Age	20 years or less	122	16.2
	21 years old	160	21.3
	22 years old	174	23.1
	23 years old	180	23.9
	24 years or older	116	15.4
Gender	Female	496	66.0
	Male	256	34.0
Nationality	Non-Saudi	20	2.7
	Saudi	732	97.3
Residential area	Northern region	26	3.5
	Southern region	224	29.8
	Center region	72	9.6
	Eastern region	44	5.9
	Western region	386	51.3
Academic level	First year	20	2.7
	Second year	52	6.9
	Third year	68	9.0

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	Fourth year	212	28.2
	Fifth year	222	29.5
	Sixth year	178	23.7
Medical school	Al-Imam Muhammad Ibn Saud Islamic University	12	1.6
	Albaha University	132	17.6
	Dar Aluloom University	14	1.9
	Hail University	14	1.9
	Jazan University	8	1.1
	Jeddah University	94	12.5
	King Abdulaziz University	18	2.4
	King Saud University	18	2.4
	Majmaah University	8	1.1
	Najran University	92	12.2
	Saud Bin Abdulaziz University for Health Sciences	14	1.9
	Taibah University	252	33.5
	Taif University	6	.8
	Umm Al-Qura University	20	2.7
	Other	30	4.0
Grade point average (GPA)	Satisfactory (1.00 - 1.74 Out Of 4.00) Or (2.00 - 2.74 Out Of 5.00)	10	1.3
	Good (1.75 - 2.74 Out Of 4.00) Or (2.75 - 3.74 Out Of 5.00)	58	7.7
	Very Good (2.75 - 3.49 Out Of 4.00) Or (3.75 - 4.49 Out Of 5.00)	274	36.4
	Excellent (≥ 3.50 Out Of 4.00) Or (≥ 4.50 Out Of 5.00)	410	54.5

As shown in figure 1, The data reveals the distribution of chest compression locations, highlighting a clear preference for the mid-chest area, which accounts for 41.2% of all responses, with 412 instances noted. This is significantly greater than the left side of the chest, which represents 5.6% of the total at

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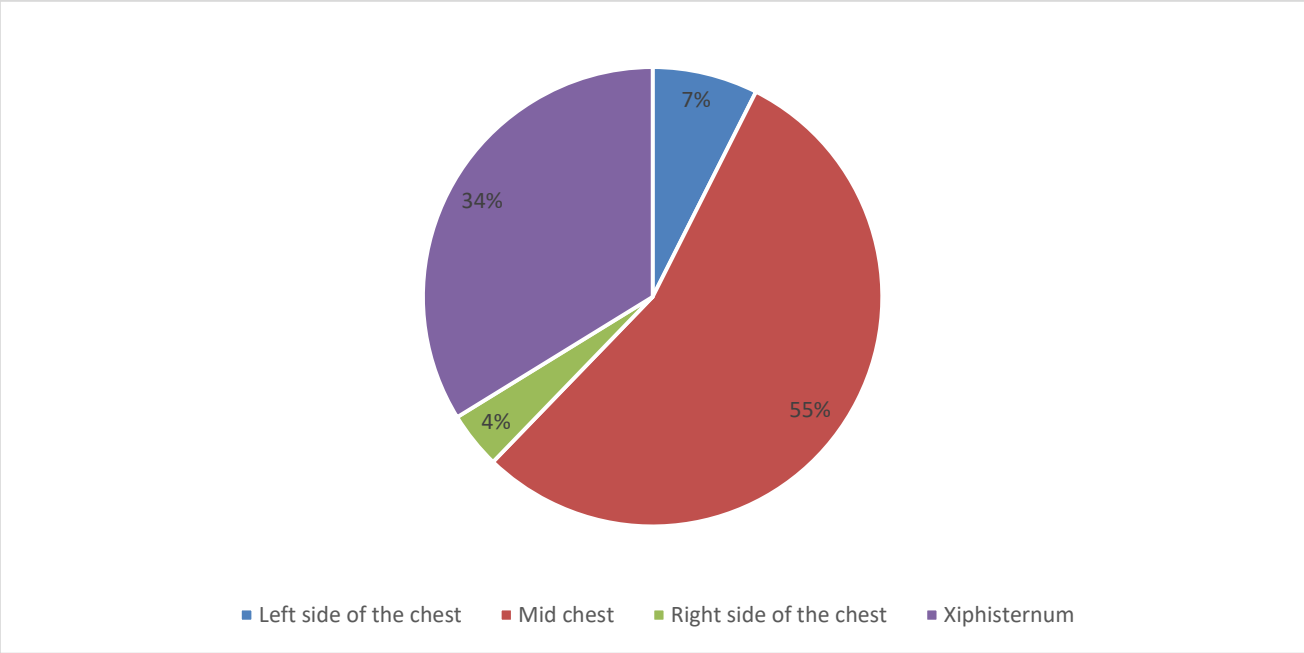
56 responses. The xiphisternum follows, contributing 25.4% with 254 responses, while the right side of the chest is the least common location, capturing only 3% at 30 responses.

Figure (1): Illustrates chest compression's location according to participants.



As illustrated in table (2), The data provides a comprehensive overview of participants' knowledge regarding Basic Life Support (BLS) practices among a sample size of 752 individuals. The findings highlight significant variations in awareness, particularly concerning the correct definition of "BLS," with an impressive 89.6% recognizing it as "Basic Life Support." When faced with an unresponsive individual, a notable 79.8% correctly identified safety as the primary concern, although only 6.9% would initiate chest compressions immediately. Moreover, when confirming unresponsiveness, 43.9% would begin CPR, while 36.4% would opt to activate Emergency Medical Services (EMS). The data also delves into the specifics of chest compression techniques, revealing that 54.8% correctly identified the mid-chest location for adults, but knowledge varied for infants and children, suggesting a gap in training.

Table (2): Parameters related to knowledge towards BLS among participants (n=752).

Parameter		***No.***	***Percent (%)***
What does "BLS" abbreviation stand for?	Basic Life Services	40	5.3
	Basic Life Support	674	89.6
	Basic Lung Support	30	4.0
	Best Life Support	8	1.1
	Give two breathings	16	2.1

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You are alone, and you find someone unresponsive in the middle of the road, what your first response should be?	Look for safety	600	79.8
	Open airway	84	11.2
	Start chest compression	52	6.9
You confirmed that the person is unconscious even after you talked and shook him, what your immediate action should be?	Activate EMS	274	36.4
	Observe	50	6.6
	Put him in recovery position	98	13.0
	Start CPR	330	43.9
What is chest compression's location?	Left side of the chest	56	7.4
	Mid chest	412	54.8
	Right side of the chest	30	4.0
	Xiphisternum	254	33.8
What is chest compression's location in infants?	At the intermammary line	162	21.5
	At Xiphisternum	88	11.7
	One finger breadth above the nipple line	124	16.5
	One finger breadth below the nipple line	378	50.3
Which of the following is NOT the correct option to do if you want to avoid doing mouth-to-mouth CPR?	Bag mask ventilation with chest compression	150	19.9
	Chest compression only	140	18.6
	Mouth-mask ventilation and chest compression	108	14.4
	No CPR	354	47.1
How to give rescue breaths to infants?	Mouth-to-mouth and nose	256	34.0
	Mouth-to-mouth with nose pinched	286	38.0
	Mouth-to-mouth without nose pinched	152	20.2
	Mouth-to-nose only	58	7.7
	½ – 1 inch	26	3.5

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The correct depth of chest compression for adults is?	1 – 1½ inches	56	7.4
	1½ – 2 inches	322	42.8
	2½ – 3 inches	348	46.3
The correct depth of chest compression for children is?	½ – 1 inches	206	27.4
	1½ – 2 inches	220	29.3
	2½ – 3 inches	86	11.4
	One half to one-third depth of chest	240	31.9
The correct depth of chest compression for neonates is?	½ – 1 inches	234	31.1
	1½ – 2 inches	78	10.4
	2½ – 3 inches	38	5.1
	One half to one-third depth of chest	402	53.5

As shown in figure (2), Upon analyzing the data regarding the correct depth of chest compression for adults, it is evident that a significant majority of responders, accounting for 69.6%, recognize the need for compressions exceeding 2 inches. Specifically, 348 individuals (48.5%) indicated that the appropriate compression depth falls within the range of 2½ to 3 inches, while an additional 322 individuals (44.3%) aligned with the 1½ to 2 inches category. Notably, only 26 responders (3.6%) selected a compression depth of ½ to 1 inch, suggesting a minimal adherence to this guideline, while a larger segment, representing 56 individuals (7.8%), acknowledged the 1 to 1½ inches range.

Figure (2): Illustrates the correct depth of chest compression in CPR among participants.

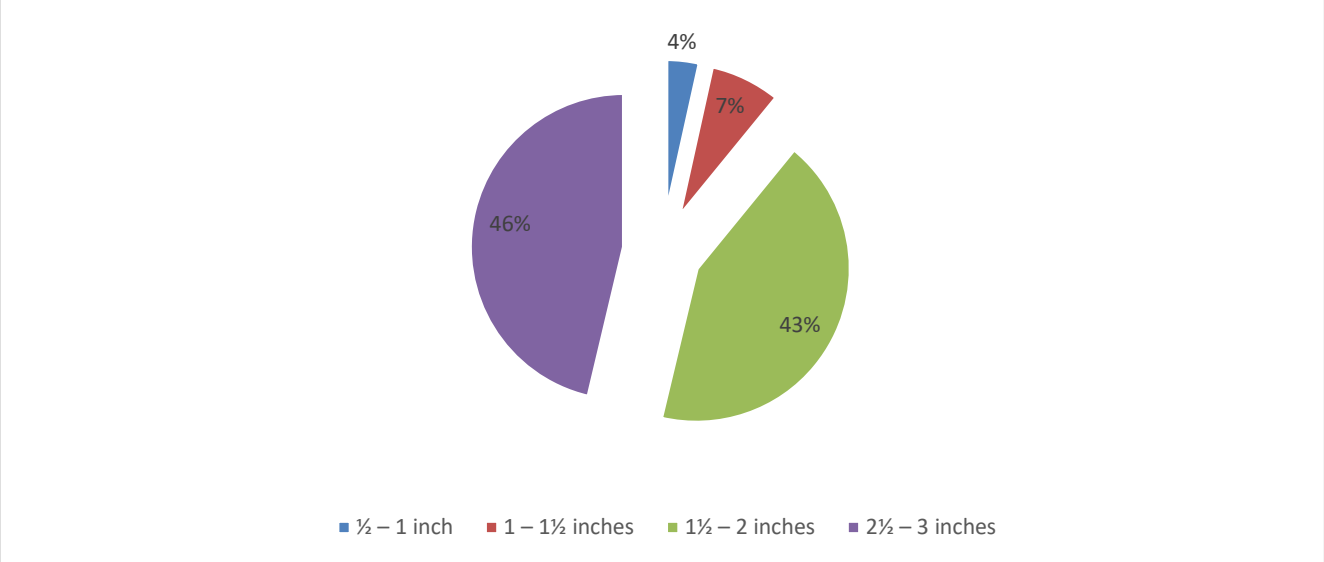

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Table (3) reveals the level of awareness among participants regarding basic life support (BLS) procedures, revealing notable insights into their knowledge and understanding of critical emergency response techniques. A significant majority, 65.7%, correctly identified the optimal rate for chest compressions for adults and children as being between 100 to 120 compressions per minute, indicating a solid grasp of this fundamental aspect of CPR. Similarly, a striking 66.5% acknowledged the correct compression-to-ventilation ratio for a single rescuer performing CPR on an adult as 30:2. However, there are areas of concern, particularly in recognizing the abbreviation for Automated External Defibrillator (AED), where only 31.9% of participants chose the correct definition.

Table (3): participants' awareness towards BLS (n=752).

Parameter		***No.***	***Percent (%)***
Adults and children correct rate of chest compression is?	70/min - 80/min	76	10.1
	80/min - 90/min	78	10.4
	100/min - 120/min	494	65.7
	120/min - 140/min	104	13.8
The correct ratio of CPR for an adult when there is a single rescuer is?	15:1	84	11.2
	15:2	78	10.4
	30:2	500	66.5
	5:1	90	12.0
The correct chest compression: ventilation ratio for a neonate is?	15:2	334	44.4
	30:2	160	21.3
	5:1	84	11.2
	3:1	174	23.1
What does "AED "abbreviation stand for?	Advanced Electrical Defibrillator	162	21.5
	Advanced External Defibrillator	58	7.7
	Automated Electrical Defibrillator	292	38.8
	Automated External Defibrillator	240	31.9
What does "EMS" abbreviation stand for?	Effective Medical Services	60	8.0

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	Emergency Management Services	150	19.9
	Emergency Medical Services	480	63.8
	External Medical Support	62	8.2
Your friend suddenly starts expressing choking symptoms when you are eating together, your first response should be?	Confirm foreign body aspiration by talking to him	334	44.4
	Give abdominal thrusts	266	35.4
	Give back blows	84	11.2
	Give chest compression	68	9.0
An infant suddenly starts to choke while playing with a toy, you witness and have confirmed that he is unable to cry and/or cough. your first response should be?	Back blows and chest compression of five cycles each then open the mouth and remove foreign body only when it is seen	464	61.7
	Give water to the infant	36	4.8
	Start CPR immediately	64	8.5
	Try to remove the suspected foreign body using a blind finger sweeping technique	188	25.0
You witness an adult unresponsive victim who has just been removed from submersion in fresh water. He has spontaneous breathing but is unresponsive. your first response should be?	Compress the abdomen to remove the water	96	12.8
	CPR for 1minute and inform EMS	128	17.0
	CPR for 2minutes and inform EMS	242	32.2
	Keep him in recovery position	286	38.0
Your colleague has suddenly developed slurring of speech and weakness of the right upper limb. what should you do?	Possibly stroke, he may require thrombolysis and hence activate emergency medical services	464	61.7
	Possibly stroke, get him to the nearest clinic	154	20.5
	May be due to sleep deprivation, make him sleep	92	12.2

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	Offer him some drinks, probably hypoglycemia	42	5.6
A 50-year-old gentleman presents with retrosternal chest discomfort, profuse sweating and vomiting. What is the most suitable action?	Probably indigestion, hence, give soda	26	3.5
	Walk him to the nearest clinic	124	16.5
	Probably acid peptic disease, give antacid and Ranitidine	128	17.0
	Probably myocardial infarction, hence, activates EMS, give an aspirin tablet, and allow him to rest	474	63.0

The data presented in Table (4) reveals a concerning trend regarding the knowledge and awareness levels of Saudi medical students towards Basic Life Support (BLS). A mere 10.1% of participants demonstrated a high level of knowledge, while a substantial 35.9% exhibited a moderate level, indicating a potential gap in comprehensive understanding essential for effective emergency response. Alarmingly, over half of the participants, specifically 54.0%, were categorized as having a low level of knowledge regarding BLS protocols.

Table (4): Shows knowledge and awareness level of Saudi medical students towards BLS score results.

	Frequency	**Percent**
High level of knowledge	76	10.1
Moderate level of knowledge	270	35.9
Low level of knowledge	406	54.0
Total	752	100.0

Table (5) shows that knowledge and awareness towards BLS has statistically significant relation to gender (P value=0.002), age (P value=0.0001), nationality (P value=0.001), academic level (P value =0.0001), and GPA (P value=0.027). It also shows statistically insignificant relation to residential area.

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Table (5): Relation between knowledge and awareness level of Saudi medical students towards BLS.

Parameters		***Knowledge level***		***Total (N=752)***	***P value****
		High or moderate knowledge	**Low knowledge**		
Gender	Female	248	248	496	0.002
		71.7%	61.1%	66.0%	
	Male	98	158	256	
		28.3%	38.9%	34.0%	
Age	20 years or less	38	84	122	0.0001
		11.0%	20.7%	16.2%	
	21 years old	88	72	160	
		25.4%	17.7%	21.3%	
	22 years old	98	76	174	
		28.3%	18.7%	23.1%	
	23 years old	80	100	180	
		23.1%	24.6%	23.9%	
	24 years or older	42	74	116	
		12.1%	18.2%	15.4%	
Nationality	Saudi	344	388	732	0.001
		99.4%	95.6%	97.3%	
	Non-saudi	2	18	20	
		0.6%	4.4%	2.7%	
Residential area	Northern region	16	10	26	0.114
		4.6%	2.5%	3.5%	
	Southern region	104	120	224	
		30.1%	29.6%	29.8%	
	Center region	26	46	72	
		7.5%	11.3%	9.6%	

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	Eastern region	16	28	44	
		4.6%	6.9%	5.9%	
	Western region	184	202	386	
		53.2%	49.8%	51.3%	
Academic level	First year	6	14	20	0.0001
		1.7%	3.4%	2.7%	
	Second year	4	48	52	
		1.2%	11.8%	6.9%	
	Third year	22	46	68	
		6.4%	11.3%	9.0%	
	Fourth year	110	102	212	
		31.8%	25.1%	28.2%	
	Fifth year	124	98	222	
		35.8%	24.1%	29.5%	
	Sixth year	80	98	178	
		23.1%	24.1%	23.7%	
Grade point average (GPA)	Satisfactory (1.00 - 1.74 Out Of 4.00) Or (2.00 - 2.74 Out Of 5.00)	0	10	10	0.027
		0.0%	2.5%	1.3%	
	Good (1.75 - 2.74 Out Of 4.00) Or (2.75 - 3.74 Out Of 5.00)	26	32	58	
		7.5%	7.9%	7.7%	
	Very Good (2.75 - 3.49 Out Of 4.00) Or (3.75 - 4.49 Out Of 5.00)	124	150	274	
		35.8%	36.9%	36.4%	
	Excellent (≥ 3.50 Out Of 4.00) Or (≥ 4.50 Out Of 5.00)	196	214	410	
		56.6%	52.7%	54.5%	

P value was considered significant if ≤ 0.05.

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Discussion:

BLS encompasses the recognition of sudden cardiac arrest, heart attack, stroke, and foreign body airway obstruction, alongside the execution of CPR and the use of an automated external defibrillator for defibrillation. Sudden cardiac arrests and accidents are prevalent types of emergencies that can lead to severe outcomes; however, implementing straightforward techniques and skills can enhance the prognosis, with immediate CPR potentially doubling or tripling survival rates [10]. Most individuals who suffer an out-of-hospital cardiac arrest do not receive timely and adequate resuscitation from healthcare providers within the crucial 3–5 minute window post-onset, which diminishes their survival chances. The likelihood of successful resuscitation following a sudden cardiac arrest declines by 7–10% for each minute that CPR is delayed [11]. Administering a shock with a defibrillator (CPR followed by defibrillation) within 3–5 minutes of the incident can achieve survival rates between 49% and 75%. The effectiveness of CPR outside of hospitals is influenced by multiple factors, with the timing of CPR initiation being the most significant. Patients who receive immediate resuscitation after cardiac arrest have a survival rate that is two to three times greater (8.2% compared to 2.5% for those who did not undergo CPR) [12]. Additionally, if CPR is not commenced right after the cardiac arrest, the survival likelihood decreases at a rate of 7-10% per minute after the event starts. Proficiency in BLS and the ability to perform basic CPR techniques can significantly enhance a patient's chance of survival until professional medical assistance arrives, often being sufficient for survival on its own. In Saudi Arabia, there is limited data concerning awareness and perceptions of BLS; nevertheless, available evidence indicates that people in Saudi Arabia possess low levels of BLS knowledge, albeit with a favorable attitude towards BLS training [13]. Thus, we aimed in this study to assess the knowledge and awareness level of basic life support among Saudi medical students.

The current findings regarding the knowledge and awareness of BLS reveal notable contrasts and parallels with previous research. For instance, the study by Yousef Abdulwahab Alghamdi [14] showcased an alarming deficiency in BLS knowledge, with overall scores significantly lower than those found in the current study. Notably, only 23.11% of participants in Alghamdi's research had undergone BLS training, and a mere 12.5% had actually performed BLS techniques, highlighting a considerable gap in practical application. Similarly, the findings of Mohammad Reza Jamalpour [15] echoed these deficiencies, indicating that nearly 39% of participants could not correctly answer any CPR-related questions, with only 4% demonstrating proper CPR execution on a manikin. In contrast, Greenwood et al. [16] reported a more optimistic perspective, noting that 81% of participants believed they could effectively manage cardiopulmonary arrest, suggesting a discrepancy between self-perception and actual knowledge. In the study conducted by Awais Ahmad et al. [17], participants who received formal BLS training exhibited improved knowledge scores (mean score of 10.41), particularly among emergency medical services students, who achieved the highest mean knowledge score (11.5). This finding aligns with our discovery of significant correlations between BLS knowledge and various demographic factors, reinforcing the importance of targeted training. On the other hand, Maha A Al-Mohaissen et al. [18] detailed a similarly low mean overall knowledge score of 32.7 ± 13.9, wherein a substantial portion of participants (87.9%) exhibited very poor knowledge, and 32.5% had never received BLS training. This further emphasizes the necessity for enhanced educational initiatives, as 77% expressed a desire for additional BLS training, akin to the 89.6% identification rate in our findings. The study by Chandrasekaran et al. [19] further corroborated the general trend of inadequate BLS understanding in medical, pharmacy, nursing, and dentistry students, with 84.82% scoring less than 50%. Additional insights were provided by Abbas, Bukhari, and Ahmad [20], who similarly reported

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that medical students averaged less than 50% in their first aid and BLS knowledge assessments, further underscoring the widespread knowledge gaps observed. Furthermore, Xanthos et al. [21] indicated that a significant number of nurses possessed insufficient BLS knowledge, resonating with findings from Passali et al. [22], which highlighted a lack of awareness among both medical doctors and nurses regarding BLS protocols. Notably, a study at King Saud University confirmed the strong interest in BLS training, with 88% of students advocating for its inclusion in curricula [23].in term of sociodemographic characteristics, Alotaibi *et al*. [24] found that female students achieved significantly higher scores than male students when comparing BLS knowledge levels by gender among Saudi dental students. Reddy *et al*. [25] similarly observed higher mean knowledge scores among female dental students compared to their male counterparts.

Conclusion:

In conclusion, this study highlights a concerning gap in the knowledge and awareness of Basic Life Support (BLS) principles among Saudi medical students. Despite a significant proportion of participants identifying key aspects of BLS, such as the definition and fundamental techniques involved in resuscitation, only a minority demonstrated a comprehensive understanding necessary for effective emergency response. Notably, while the majority recognized safety and the need to activate Emergency Medical Services when faced with an unresponsive individual, the willingness and readiness to initiate CPR in real scenarios were markedly low.

The findings also reveal demographic influences on BLS knowledge, with gender and academic year showing significant associations. This underpins the necessity for tailored educational interventions that address these disparities, ensuring that medical students not only acquire theoretical knowledge but also engage with practical training methods, such as simulation and hands-on CPR practice. A high willingness among students for additional BLS training suggests a favourable environment for the integration of comprehensive BLS training into medical curricula.

Ultimately, enhancing BLS education and awareness among future healthcare providers is essential, as their preparedness can directly impact survival outcomes in critical situations, reinforcing the vital role of timely and effective responses in emergency care scenarios.

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Ethical approval:

An informed consent was obtained from each participant after explaining the study in full and clarifying that participation is voluntary. Data collected were securely saved and used for research purposes only.

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Conflict of interests:

The authors declare no conflict of interest.

Informed consent:

Written informed consent was acquired from each individual study participant.

Data and materials availability:

All data associated with this study are present in the paper.

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