

**How to Cite:**

AlQahtani, N. T., Albassam, A. M., Alonzi, T. H., Al-Harbi, O., Alshamma, A. R., Alhamdan, H. A., Alonzi, M. S., & Alenzi, A. S. (2023). Assessment of basic life support (BLS) knowledge and awareness among teachers in Al-Kharj City, Saudi Arabia. *International Journal of Health Sciences*, 7(S1), 3038–3049. Retrieved from <https://sciencescholar.us/journal/index.php/ijhs/article/view/14644>

## **Assessment of basic life support (BLS) knowledge and awareness among teachers in Al-Kharj City, Saudi Arabia**

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**Abstract**--Background. Cardiac arrest (CA) is a life-threatening medical emergency that occurs 70% of the time outside of a hospital environment. Aim: The study objects to assess the teachers in Al-Kharj city, Saudi Arabia, and to determine their current BLS knowledge and awareness and to assess their attitudes and willingness to participate in regular BLS training. Methods. A cross-sectional survey was conducted among a total of 188 teachers in the region. Results. The study reveals a concerning 57.4% of respondents lack basic CPR understanding, underscoring a significant deficit in essential lifesaving skills. Receptively, the study shows a positive inclination among teachers, with 73.9% expressing intent to enroll in BLS courses in the future. Moreover, a compelling 91.5% assert that BLS should be integrated into the standard school curriculum, underlining a collective awareness of the imperative to incorporate these life-saving skills systematically into mainstream education. Conclusions. The findings highlight a critical need for targeted educational interventions to bridge the knowledge gap and enhance BLS awareness regularly among teachers. The identified knowledge gaps, coupled with positive attitudes towards CPR education, present an opportune moment for strategic interventions.

**Keywords**--basic life support (BLS), teachers, life-saving skills.

**Introduction**

It is well documented that when basic life support (BLS) is administered by bystanders at the scene, the potential of cardiac arrest cases being resuscitated improves by two-to-three-time, (GUN and ALDINC (2022). Cardiac arrest (CA) is a life-threatening medical emergency that 70% of the time occurs outside of a hospital environment. In comparison, for every minute that CPR is delayed, the possibility of survival drops by 7 to 10 %, (Ghrayeb et al. (2017). A cardiac arrest affects 600 000 individuals in the US annually. According to estimates, and arrests that take place in public places have a survival rate of less than 6%. In-hospital cardiac arrest survival rates have increased but are still poor (24%). In addition, Cardiac arrest can happen to anyone of any age, but it primarily affects older individuals, (Altherwi et al., 2022).

American Academy of Pediatrics (AAP) Committee on Pediatrics Emergency Medicine reported Every year, more than 300,000 adults and 6,000 children face an out-of-hospital cardiac arrest (OHCA), (Srinivasan et al. (2019). There have been reports of sudden infant death syndrome, trauma, and respiratory arrest as common causes of out-of-hospital cardiac arrest in pediatric patients. In addition, Pediatric cardiac arrests outside of a hospital have been linked to cardiac reasons more frequently than other causes. (Salleeh et al., 2016). BLS is an immediate

recognition of cardiac arrest, stroke, and foreign body airway obstruction indications, as well as the beginning of essential breathing and circulation management techniques (Ghrayeb et al. (2017).

During school hours, students can be at danger for several incidents, including choking, falling, and being injured. In addition, given their position in the classroom and their responsibilities for the health and safety of students there, teachers are regarded as guardians of students. In addition, knowing first aid could help teachers prevent injuries in the critical early minutes following an accident, which would decrease student morbidity and mortality rates, (Altherwi et al., 2022). Furthermore, we can say that teachers play a crucial part in emergencies where BLS is required because children spend a lot of their time away from their families at school. It is crucial that the teachers who are with the kids are prepared to step in early and effectively. In this manner, teachers will be able to increase lifesaving skills while also giving students the appropriate BLS training. (GUN and ALDINC, 2022).

In Saudi Arabia, Saudi Arabian citizens have inadequate training and education, (Al Enizi et al., 2016). Previous researches indicated poor the BLS knowledge and training of Saudi schoolteachers, (Altherwi et al., 2022). Moreover, teachers in Saudi Arabia are not required to receive BLS training, so they are likely lacking in practical knowledge and abilities, which might cause them to either recognize a victim's problem slowly or fail to do CPR in an effort to save a life, (Alhejaili, Alghamdi and Al-Dubai, 2020). We designed this study to assess the teachers in AlKharj city, Saudi Arabia, and to determine their current knowledge and awareness but to assess their attitudes and willingness to participate in regular CPR training.

## **Methods**

A cross-sectional survey was conducted among 188 teachers in Al-Kharj city to assess their awareness of basic life support (BLS). The purpose of the survey was to gather information about the teachers' knowledge and understanding of BLS techniques, such as cardiopulmonary resuscitation (CPR) and the use of automated external defibrillators (AEDs). The survey included questions about the teachers' familiarity with BLS, their confidence in performing BLS interventions, and their previous training experiences. The results of the survey will provide valuable insights into the overall level of BLS awareness among teachers in the region and help identify areas where further training and education may be needed to enhance their ability to respond to medical emergencies effectively. In addition, to assessing the teachers' awareness of basic life support (BLS), the cross-sectional survey also aimed to gather information on their previous exposure to BLS training. The survey asked about the frequency and regency of any BLS training sessions they may have attended, as well as their level of confidence in applying BLS techniques in different emergency scenarios.

The survey instrument included questions designed to gauge the teachers' understanding of key BLS concepts, such as the recognition of cardiac arrest, the correct steps to perform CPR, and the proper use of AEDs. It also explored their knowledge of common signs and symptoms of medical emergencies that require

immediate intervention. By conducting this survey among teachers, the goal was to gain insights into the current state of BLS awareness within the educational community. Teachers play a critical role in the safety and well-being of students, and having a solid understanding of BLS can make a significant difference in the event of a medical emergency at school.

The findings of the survey will provide valuable information to educational authorities, healthcare providers, and policymakers. If any gaps or deficiencies in BLS knowledge and training are identified, appropriate measures can be taken to enhance teacher preparedness and ensure a safer learning environment for students. This may include targeted BLS training programs, workshops, or educational campaigns aimed at improving BLS awareness and skills among teachers. Overall, the cross-sectional survey on BLS awareness among teachers in the region serves as a crucial step in promoting a culture of safety and preparedness within the educational community, ultimately contributing to improved emergency response and potentially saving lives.

## Result

### Demographics of the study sample

Table 1 shows the demographic characteristics of the study sample, including gender, age group, and educational stage.

Table 1  
Demographic statistics of study participants

	frequency	Percentages
Sex		
Female	34	18.1
Male	154	81.9
Current Educational Stage		
Primary	65	34.6
Medium	36	19.1
Secondary	87	46.3
Lifetime		
Less than 30 years old	6	3.2
From 30 to 40 years	64	34
From 40 to 50 years	80	42.6
From 50 to 60 years	38	20.2

Table and Figure 1 1 reveal significant demographic patterns within the study participants. The majority of respondents were male, constituting 81.9% of the participants, with females comprising 18.1%. In terms of the current educational stage, the study comprised predominantly of secondary stage students, making up 46.3% of the total participants. Primary-stage students accounted for 34.6%, and those in the middle stage represented 19.1% of the study population. When considering age distribution, 42.6% of respondents were from 40 to 50 years.

Specifically, individuals from 30 to 40 years constituted 34.0%, while respondents under the age of 30 were 3.2% of the total sample.

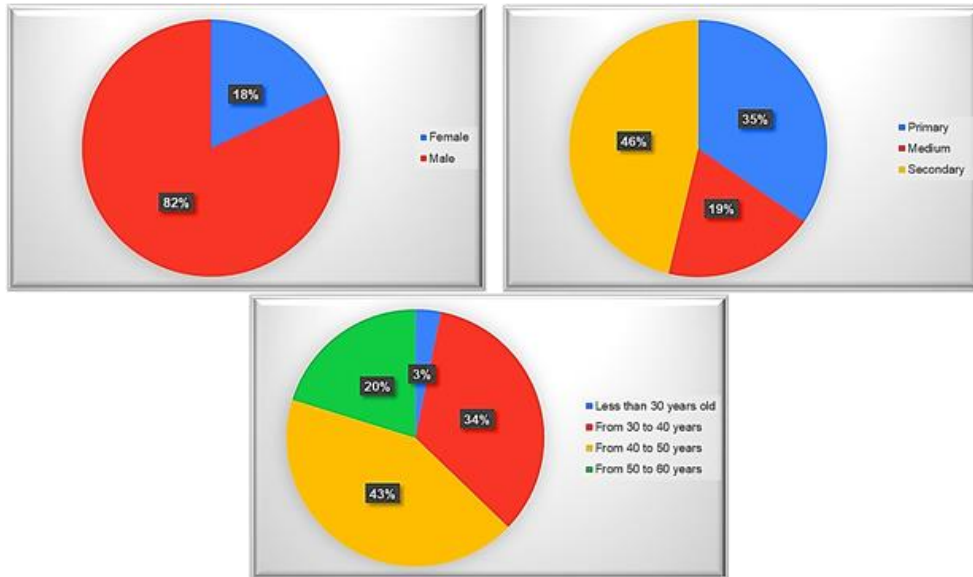


Figure 1. Distribution and demographics of the study sample

### Descriptive statistics of study questions

Table 2 shows the frequencies, percentages, and overall scores of questions related to measuring teachers' knowledge and awareness about CPR in Al-Kharj Governorate, Saudi Arabia.

Table 2  
Frequencies, percentages, and overall score of study questions

	frequency	Percentages
Do you have any knowledge or information about CPR?		
No	108	57.4
Yes	80	42.6
Have you ever taken any CPR training course?		
No	153	81.4
Yes	35	18.6
Are you interested in taking a CPR course in the future?		
No	49	26.1
Yes	139	73.9
If CPR training is available at your school, will you take the course?		
No	17	9
Yes	171	91
Do you think CPR is important for school teachers?		
No	6	3.2
Yes	182	96.8

Do you think CPR should be required for school teachers?		
No	31	16.5
Yes	157	83.5
Do you think school curricula need to add CPR and first aid to textbooks?		
No	16	8.5
Yes	172	91.5
Have you ever had a medical condition that required CPR at your school?		
No	166	88.3
Yes	2	11.7
Do you know the ambulance number in an emergency?		
No	45	23.9
Yes	143	76.1
	mean	SD
Total degree of consciousness	5.86	1.59

Table 2 offers a comprehensive and nuanced understanding of the knowledge and attitudes of individual educators pertaining to CPR. The results reveal that a concerning 57.4% of respondents lack fundamental CPR knowledge, underscoring a significant deficit in essential lifesaving skills. Conversely, 42.6% demonstrate familiarity with CPR basics, though this minority representation highlights the need for extensive educational interventions. Notably, a substantial 81.4% of participants have not undergone formal CPR training, underscoring an urgent requirement for systematic and recurring training initiatives targeting educators. This finding underscores the imperative of implementing timely and tailored educational programs for teachers.

Encouragingly, the study shows a positive inclination among educators, with 73.9% expressing intent to enroll in CPR courses in the future. Furthermore, a staggering 91% affirm their willingness to participate in these courses if made accessible within their educational institutions. A noteworthy consensus emerges among respondents, with 96.8% recognizing the criticality of CPR skills for educators. Additionally, 83.5% advocate for mandatory CPR training for teachers, reflecting a widespread belief in the necessity of institutionalizing such courses. Moreover, a compelling 91.5% assert that CPR should be integrated into the standard school curriculum, underlining a collective awareness of the imperative to incorporate these life-saving skills into mainstream education.

Interestingly, a substantial 88.3% of participants report never encountering medical emergencies necessitating CPR, indicating a fortunate lack of personal exposure to such situations. However, 76.1% exhibit awareness of the emergency ambulance number, underscoring a commendable level of preparedness to respond effectively during medical crises. In evaluating the overall awareness levels, the study participants achieved an average score of 5.86 out of a possible 9, indicating a moderate level of awareness. In conclusion, these findings underscore an enduring need to bolster CPR awareness within the educational landscape of Saudi Arabia. By enhancing educators' preparedness for emergency response, these initiatives hold the potential to significantly contribute to saving lives and ensuring the safety of school communities.

### Comparison of the degree of consciousness according to the gender

Table 3 shows the Comparison of the total degree of consciousness according to the gender variable using a Whitney test.

Table 3  
Comparison of total degree of consciousness according to the gender variable

Sex	mean	SD	Mean ranks	Sum of ranks	P-value
female	5.65	1.346	81.75	2779.5	0.12
male	5.9	1.64	97.31	14986.5	

As shown in Table 3 and Figure 2, the average consciousness score for males was 5.90 out of a total of 9. In contrast, females had an average score of 5.65. However, despite these apparent differences, the results of the statistical analysis indicate that there are no statistically significant disparities in the overall awareness levels based on the gender variable. This suggests that, although there are slight variations in average scores between males and females, these differences do not hold statistical significance. Therefore, the gender factor does not appear to influence the overall degree of consciousness significantly, according to the conducted analysis.

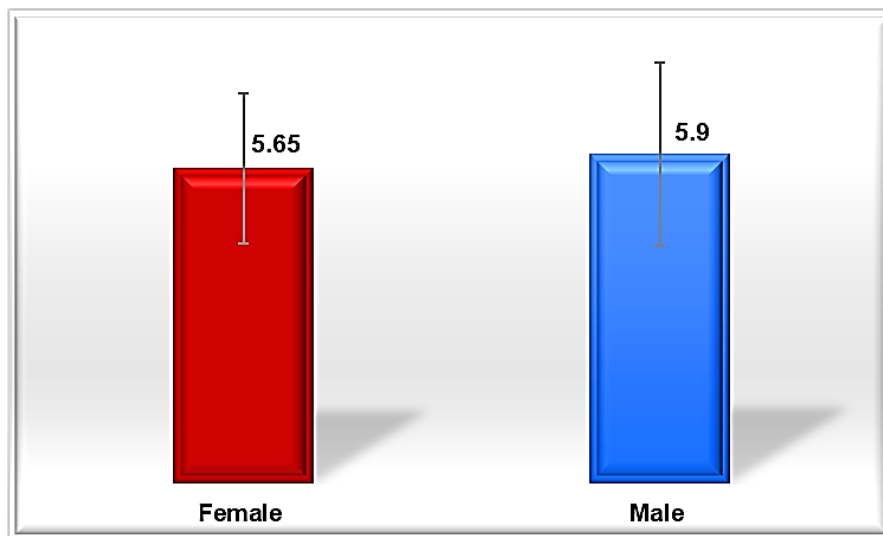


Figure 2. The average total degree of consciousness of males and females in the study sample

### Comparison of the degree of awareness according to the educational level of the participants

Table 4 shows the Comparison of the total degree of consciousness according to the educational participant level, using a Kruskal Wallis test.

Table 4  
Comparison in the total degree of consciousness according to the Educational level

Educational Stage	Mean	SD	Mean ranks	P-value
primary	5.985	1.682	100.24	0.352
medium	6.056	1.372	98.58	
secondary	5.678	1.61	88.52	

As shown in Table 4 and Figure 3, no statistically significant difference was found in the degree of consciousness regarding the participant's educational level. Therefore, this result indicates that the awareness of participants in the study concerning cardiopulmonary resuscitation remains consistent irrespective of their educational stage.

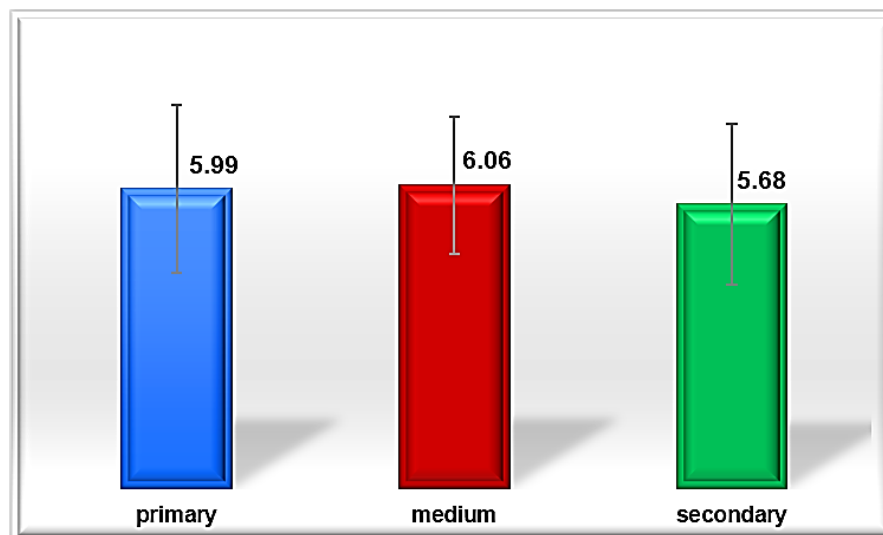


Figure 3. Average total awareness score for the study sample according to the educational stage

### Comparison of the degree of consciousness according to the age

Table 5 shows the comparison of the total degree of consciousness according to the age of the participant, using a Kruskal Wallis test.

Table 5  
Comparison in the total degree of consciousness according to the ages of the study participants

Age Group	Mean	SD	Mean ranks	P-value
less than 30 years old	6.167	1.835	99.17	0.888
From 30 to 40 years	5.828	1.579	96.98	

From 40 to 50 years	5.775	1.721	90.96
From 50 to 60 years	6.026	1.325	97.05

Table 5 and Figure 4 highlight the consistent levels of awareness observed among participants in the study sample concerning their age groups. Notably, the degree of consciousness remained steady across various age brackets, ranging from 6.167 for individuals below 30 years to 5.775 for those aged between 40 and 50 years. The statistical analysis, as denoted by a significance level value of 0.888, yielded a statistically insignificant result. This finding affirms the absence of noteworthy disparities in awareness levels related to gender among the study sample members regarding cardiopulmonary resuscitation across different age groups. In essence, the data demonstrates that the awareness of teachers in the study concerning cardiopulmonary resuscitation remains consistent regardless of their age, as substantiated by the statistically insignificant findings.

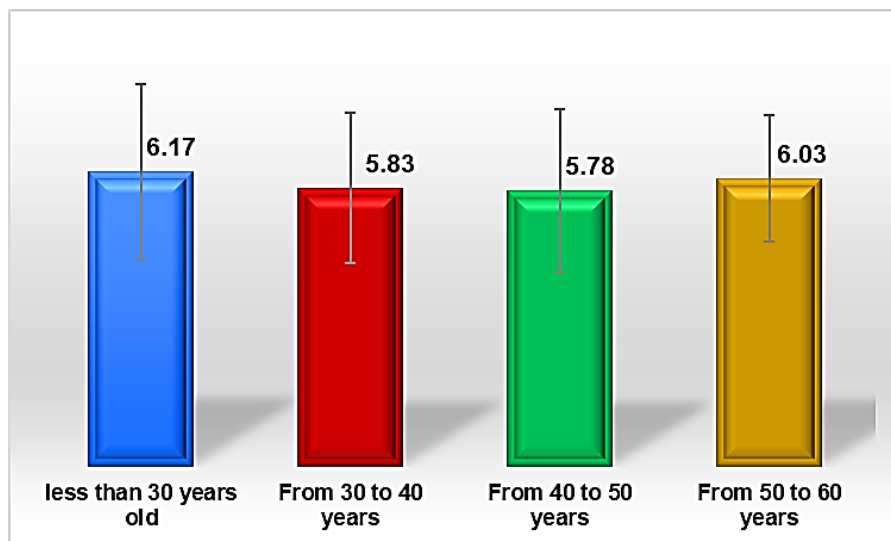


Figure 4. The average degree of total awareness of the study sample members according to the age group

In summary, the study reveals a concerning lack of CPR knowledge among teachers, with only 57.4% possessing basic CPR understanding. However, there is a noticeable uptick in teachers expressing interest in CPR courses, as evidenced by 73.9% considering future participation and an overwhelming 91% willing to attend if offered within their school premises. The survey underscores the widespread recognition of CPR's significance among educators, with 96.8% of respondents expressing support for its incorporation into the curriculum. Additionally, the research indicates that there are no statistically significant disparities in CPR awareness among male and female teachers in Al-Kharj Governorate, Saudi Arabia. This lack of differentiation holds across gender, age, and educational variables. These findings underscore the need for targeted educational interventions to bridge the knowledge gap and enhance CPR awareness uniformly among teachers in the region.

## **Discussion**

The findings of this research underscore critical considerations for the state of CPR knowledge and awareness among educators in Al-Kharj Governorate, Saudi Arabia. The demographic composition of the study sample provides a foundation for interpreting subsequent analyses, revealing a predominantly male, secondary stage-oriented, and diverse age-grouped cohort. The significant deficit in CPR knowledge, with 57.4% of respondents lacking fundamental awareness, is a cause for concern. This knowledge gap is exacerbated by the revelation that 81.4% have not undergone formal CPR training. These figures signify a substantial lacuna in essential life-saving skills within the educator cohort, necessitating immediate attention.

Conversely, the positive inclinations and attitudes among educators are noteworthy. A considerable majority express an interest in future CPR courses (73.9%), with an overwhelming 91% willing to participate if such courses were integrated into their educational institutions. This enthusiasm is a promising precursor for the potential success of future CPR education initiatives. Recognition of the criticality of CPR skills is pervasive among educators, with 96.8% acknowledging its importance. Furthermore, substantial support exists for the institutionalization of CPR training, as indicated by 83.5% of participants advocating for mandatory CPR courses for teachers. The overwhelming consensus (91.5%) on the integration of CPR and first aid into the standard school curriculum emphasizes a collective awareness of the imperative to incorporate life-saving skills systematically into mainstream education.

Demographic differentiators such as gender, age, and educational level do not yield statistically significant differences in CPR awareness. This suggests that the identified knowledge gaps are uniformly distributed across diverse teacher profiles, emphasizing the need for comprehensive and inclusive educational interventions. The average overall awareness score of 5.86 out of 9 indicates a moderate level of awareness. While this suggests a foundational understanding of CPR, continuous training and periodic evaluations are imperative to elevate teachers' CPR skills and preparedness continually.

## **Conclusion**

In conclusion, the research illuminates a critical need for targeted interventions to enhance CPR awareness and skills among educators in Al-Kharj Governorate. The identified knowledge gaps, coupled with positive attitudes towards CPR education, present an opportune moment for strategic interventions. The recommendations stemming from this study advocate for the implementation of regular and continuous CPR training programs integrated into teachers' professional development initiatives. The integration of CPR into the school curriculum is paramount for creating a culture of preparedness and life-saving skills within the educational landscape.

The uniform distribution of CPR awareness gaps across demographics underscores the necessity for inclusive educational initiatives that address the diverse profiles of educators. Cultural awareness campaigns, active participation

encouragement, and regular evaluations are crucial components of a comprehensive strategy to bridge existing gaps and elevate CPR awareness uniformly among teachers.

In summary, by addressing the identified knowledge gaps, fostering positive attitudes towards CPR education, and implementing targeted interventions, there is a substantial opportunity to enhance the overall preparedness and safety of educational communities in Al-Kharj Governorate. These insights contribute to the broader discourse on the integration of life-saving skills within educational frameworks, emphasizing the importance of continual education and a collaborative effort to ensure the well-being of educators and students alike.

### **Recommendations**

The study's findings suggest the following recommendations for improving CPR awareness and preparedness among teachers in Al-Kharj Governorate:

- **Develop Ongoing Training Programs:** Implement regular and continuous CPR training programs for teachers as part of their professional development.
- **Integrate CPR into the School Curriculum:** Incorporate CPR lessons into the school curriculum to engage students actively and foster a culture of preparedness and life-saving skills.
- **Promote Cultural Awareness:** Raise awareness about the importance of CPR within schools and the broader community through social media, workshops, and other platforms.
- **Encourage Active Participation:** Actively encourage teachers to engage in CPR courses, offering incentives for continued participation and utilization of these educational opportunities.
- **Regular Evaluation:** Conduct periodic assessments of teachers' CPR awareness and skills to monitor progress and guide ongoing development of CPR education initiatives.

In conclusion, the research emphasizes the need for comprehensive and sustained efforts to improve CPR awareness and skills among teachers, ultimately contributing to the safety and well-being of school communities in Al-Kharj Governorate, Saudi Arabia.

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