



Knowledge, Attitudes, and Self-Efficacy Toward Cardiopulmonary Resuscitation Among Intensive Care Unit Healthcare Professionals at a secondary healthcare facility (Ibn Sina teaching hospital – Sirte)

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ABSTRACT

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Background: The effectiveness of cardiopulmonary resuscitation (CPR) is critically dependent on the capacity and preparedness of health professionals. The aim of this study was to evaluate the knowledge and attitudes of CPR among health professionals in the intensive care unit (ICU) at Ibn Sina Hospital in Sirte City, Libya.

Methods: A cross-sectional study was conducted among 27 ICU health professionals, including doctors, anesthesia and intensive care technicians, nurses and other specialists. A structured questionnaire was used to collect data on demographics, CPR training and experience, attitudes to resuscitation and theoretical knowledge, which was assessed through a 15-point test.

Results: The study included 27 participants (59.3% male, 40.7% female), including 7 doctors (25.9%), 14 anesthesia and intensive care technicians (51.9%), 3 nurses (11.1%) and 3 other professionals (11.1%). Most (88.8%) had received formal CPR training, and 63.0% had performed CPR before. The attitudes were overwhelmingly positive, with 100% of the participants who agreed that CPR knowledge is an essential part of their work. However, a significant knowledge gap was identified; Only 18.5% of participants scored more than 85% in the theoretical knowledge test, while 33.3% scored less than 65%. While 81.5% believed that their training was sufficient, only 55.5% were confident in their ability to save lives by using their CPR skills.

Conclusion: Despite overwhelming positive attitudes towards the importance of CPR, there are significant failings in theoretical knowledge among health services in ICU at the place of the study. These findings highlight the urgent need for arranged, routine and practical CPR training programs to bridge the lacuna between the approach and the ability, thus improving patient results in cardiac arrests

minutes of collapse can improve patients' survival rates. Despite these advances, cardiac arrest remains a substantial public health problem and a leading cause of death worldwide, occurring both in and out of the hospital setting.

CPR training, initially designed for healthcare providers, has expanded to include bystanders who witness cardiac arrest events even outside hospitals, aiming at delivering adequate resuscitation as early as possible, studies have shown that immediate bystander

1 Introduction

Cardiopulmonary resuscitation (CPR) is one of the most critical and evolving areas of modern medicine, comprising a series of lifesaving actions that significantly improve survival rates following cardiac arrest. Many resuscitation entities such as The American Heart Association (AHA) and the European Resuscitation Council emphasize that administering CPR and defibrillation within the first three to five

CPR doubles or even triples the chances of survival, while delayed CPR decreases survival chances by 7-10% per minute. However, the quality of CPR training and practice varies globally, with significant disparities in knowledge and skills among health care providers working at emergency and resuscitation units.

In many countries, CPR certification is not required for graduation from medical and health sciences schools. This results in suboptimal CPR knowledge and neutral or negative attitudes towards the practice. Conversely, surveys in various regions have shown positive attitudes and eagerness towards training despite inadequate knowledge.

This study is designed to evaluate the knowledge and attitudes of healthcare providers regarding cardiopulmonary resuscitation (CPR) in secondary healthcare facility at the city of Sirte - Libya. By gaining insight into their perspectives, we aim to underscore the significance of incorporating CPR training early in medical education curricula. Ultimately, improving patient outcomes and fostering a culture of proactive life-saving skills.

2 Materials and Methods

This study presents an observational cross-sectional analysis aimed at assessing the knowledge and attitudes of healthcare providers working in the Intensive Care Unit (ICU) at Ibn Sina Teaching Hospital- Sirte - Libya. Participants included doctors, intensive care technicians, and nurses. The assessment utilised a questionnaire divided into two sections: one focusing on attitudes and the other on knowledge, which was developed in accordance with guidelines set by the American Heart Association and the European Resuscitation Council regarding both basic and advanced cardiac life support, and based on questionnaires that were used by similar studies. During October 2024, the questionnaires were administered to all ICU staff, irrespective of their specific professional roles. A total of 40 intensive care healthcare professionals were invited to participate in the study, comprising 10 physicians and 30 nurses and ICU technicians. Of the 29 questionnaires returned, two were excluded due to incomplete responses. The remaining 27 were included in the final analysis, which was conducted using SPSS statistical software.

The data collected was analyzed to generate descriptive statistics. Frequencies and percentages were calculated for all categorical variables, including demographics, training history and attitude responses. Knowledge test results were classified into four performance levels: >85% (excellent), 75–84% (BRA), 65–74% (fair) and <65% (poor). All analyzes were based on data given in the study's findings.

3 Results

The participants of this study were 16 males at 59.26% and 11 females at 40.74% of different professions (7 doctors at 25.9% of the study sample (4 males and 3 females) 14 anesthesia and intensive care technicians representing 51.85% of the participants (8 males and 6 females) 3 male nurses and 3 healthcare providers of other medical specialties at 11% each (1 male and 2 females)), as shown in table 1.

Profession	Frequency (%)	Gender (M/F)	Experience	Experience	Experience
			1-3 years (%)	3-5 years (%)	>5 years (%)
Doctors	7 (25.9%)	4 / 3	3 (42.9%)	2 (28.6%)	2 (28.6%)
Anesthesia Technicians	14 (51.9%)	8 / 6	10 (71.4%)	1 (7.1%)	3 (21.4%)
Nurses	3 (11.1%)	3 / 0	0 (0%)	1 (33.3%)	2 (66.7%)
Other Specialties	3 (11.1%)	1 / 2	3 (100%)	0 (0%)	0 (0%)
Total	27 (100%)	16 / 11	13 (48.2%)	4 (14.8%)	7 (25.9%)

Table 1 . the distribution of professions and experiences of the study's participants.

Regarding the years of work experience : among different professions 48.15% of the study population had a work experience of 1-3 years , 14.9% had 3-5 years work experience and the 25.93% of them were working for more than 5 years.

When participants were asked about have they performed CPR before their response was yes in 62.97% of the participants, and the rest denied any participating in cardiopulmonary resuscitation in their practice. Those who were involved in CPR in their year of work gave a history of resuscitating: 1-5 CPRs for 4 (14.9%) participants, 5-10 for 3 (11.1%) participants and more than 10 for 12 (44.44%) respondent. Of the total respondents 24 (88.8%) have received formal CPR training, 18 (66.6%) of the participants were trained to used defibrillator in resuscitation, and 21 (77.7%) of them informed that they have a defibrillator in their units.

In regards to the attitude of the participants toward cardiopulmonary resuscitation : despite their profession when the respondent were asked " Do you think that CPR training and knowledge is an important part of your job?" the answer was yes in 100% of the answers , 22 (81.5%) of them responded with YES for the question "Do they think that their CPR training was adequate to perform CPR confidently?" while 4 (14.9%) answered with NO and only 2 (7.4%) were NOT SURE about the same question. When the participant were asked that "the decision of initiation and termination of CPR should be taken by senior medical officer?" 96.3% of them answered with YES .

Similarly when they were asked their impression about that "all intensive care unit workers should have CPR course training before practice?" 92.6% of the answers were YES. As an answer for "CPR course should be taught during undergraduate years?" question the answers were: YES in 74% and 7% for both NO and Not Sure answers. When participants were asked about "their self-confidence in choosing and administrating emergency drugs?" 66.6% of the respondents answered with YES and 22.2% answered NO while rest were NOT SURE. And for the last question which was "Do you think that you are confident enough in saving a life with your CPR knowledge?" the answers were : 15 (55.5%) for YES, 2 (7.4%) for NO and 9 (33.3%) for

Attitude Question	Yes (%)	No (%)	Not Sure (%)
Is CPR training an important part of your job?	27 (100%)	0 (0%)	0 (0%)
Was your CPR training adequate to perform CPR confidently?	22 (81.5%)	4 (14.9%)	1 (3.7%)
Should all ICU workers have CPR course training before practice?	25 (92.6%)	2 (7.4%)	
Are you confident in choosing and administering emergency drugs?	18 (66.6%)	6 (22.2%)	3 (11.1%)
Are you confident enough in saving a life with your CPR knowledge?	15 (55.5%)	2 (7.4%)	9 (33.3%)

Not Sure.

Table 2. the frequencies of attitude questions' responses.

The evaluation of theoretical knowledge revealed significant deficiencies. Of a total score of 15, only 5 participants (18.5%) achieved a score of > 85%. On the other hand, 9 participants (33.3%) scored <65%, representing the largest single group. The remaining participants were distributed between 75–84% (7 participants, 26.0%) and 65–74% (6 participants, 22.2%) scores.

Score Category	Frequency	Percentage
>85% (Excellent)	5	18.5%
75-84% (Good)	7	26.0%
65-74% (Fair)	6	22.2%
<65% (Poor)	9	33.3%
Total	27	100%

Table 3. Distribution of CPR Knowledge Evaluation Scores (N=27)

4 Discussion

This study provides an important snapshot of cardiopulmonary resuscitation (CPR) knowledge and attitudes among health professionals working in the Intensive Care Unit (ICU) at Ibn Sena Hospital. The central findings reveal a substantial gap between the universally positive attitudes toward CPR and the relatively low theoretical knowledge scores. This dichotomy between favorable attitudes and inadequate knowledge has been repeatedly highlighted in the resuscitation literature and is considered a major barrier to providing high-quality patient care during cardiac arrest (Alsabri et al., 2024; Tomás et al., 2023).

The unanimous agreement (100%) among participants on the importance of CPR forms an encouraging basis for future educational initiatives. However, this positive attitude did not translate into high knowledge levels, with approximately one-third of the participants scoring in the "poor" range (<65%). This finding aligns with previous research across the Arab region. In a systematic review and meta-analysis, Alsabri et al. (2024) reported broad knowledge gaps among healthcare providers, noting that only 36.5% of participants knew the correct compression rate and fewer than half identified the correct compression depth. Similarly, Tomás et al. (2023) and Oteir et al. (2025) found that although nurses and allied health professionals generally demonstrated positive attitudes toward CPR, their objective knowledge and performance remained suboptimal. These consistent patterns indicate that enthusiasm alone is insufficient to ensure competent resuscitation practices.

The finding that 88.8% of our participants had received formal CPR training emphasizes that one-time or infrequent courses are not enough to maintain competence. Skill and knowledge deterioration over time is well-documented, reinforcing the need for ongoing refresher training (Alsabri et al., 2024). Studies examining educational strategies suggest that simulation-based learning offers significant advantages. Alharbi et al. (2024) demonstrated that healthcare professionals trained through simulation retained CPR skills longer and performed better under stress compared to those trained by traditional lectures. Likewise, Elendu (2024) emphasized that realistic, scenario-based simulations strengthen both cognitive and psychomotor components of resuscitation performance, leading to improved long-term retention.

A particularly remarkable finding in our study is the discrepancy between perceived and actual ability. Although 81.5% of participants believed their training was sufficient, only 55.5% expressed confidence in saving lives during cardiac arrest events. This mirrors the findings of Oteir et al. (2025) and Tomás et al. (2023), who reported that healthcare workers often overestimate their preparedness, reflecting the limited self-efficacy produced by conventional training methods. Bridging this gap requires adopting interactive, high-fidelity simulation exercises that

replicate real-life pressure and foster both teamwork and confidence (Alharbi et al., 2024; Elendu, 2024).

Furthermore, incorporating real-time feedback devices into CPR training and clinical practice has been shown to enhance skill quality. Lee et al. (2023) and Lin et al. (2025) found that audiovisual feedback significantly improves the depth and rate of chest compressions and increases participants' confidence in performing CPR. Preuss et al. (2025) similarly reported that using feedback devices during manikin practice improved adherence to compression standards, reinforcing the potential benefit of integrating such tools in continuous hospital training programs.

The present study also identified a specific training need related to defibrillation. Despite high availability of automated external defibrillators (AEDs) (77.7%), only two-thirds of participants were trained to use them. This is consistent with prior regional reports documenting low AED familiarity among healthcare workers (Alsabri et al., 2024; Oteir et al., 2025). Considering that early defibrillation is a key determinant of survival from shockable cardiac rhythms, it is crucial that all clinical personnel receive hands-on AED training as part of regular CPR courses.

5 Conclusions

In summary, while ICU staff at Ibn Sena Hospital show commendably positive attitudes toward CPR, their knowledge, self-efficacy, and readiness to use defibrillators remain below optimal levels. These findings mirror regional and international data and underscore the importance of structured, recurrent, simulation-based, and feedback-supported training programs to bridge the gap between knowledge and practice and ultimately improve patient outcomes during cardiac arrest.

6 limitations

Given the study's limited sample size and single-hospital setting, the results should be interpreted with caution and cannot be generalized without further large-scale research.

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References

- Nguyen, D.D., Spertus, J.A., Kennedy, K.F., Gupta, K., Uzendu, A.I., McNally, B.F. and Chan, P.S., 2024. Association between delays in time to bystander CPR and survival for witnessed cardiac arrest in the United States. *Circulation: Cardiovascular Quality and Outcomes*, 17(2), p.e010116.
- Koster, R.W., Baubin, M.A., Bossaert, L.L., Caballero, A., Cassan, P., Castrén, M., Granja, C., Handley, A.J., Monsieurs, K.G., Perkins, G.D. and Raffay, V., 2010. European Resuscitation Council Guidelines for Resuscitation 2010 Section 2. Adult basic life support and use of automated external defibrillators. *Resuscitation*, 81(10), pp.1277-1292.
- Ibrahim, W.H., 2007. Recent advances and controversies in adult cardiopulmonary resuscitation. *Postgraduate medical journal*, 83(984), pp.649-654.
- Sarin, H. and Kapoor, D., 2006. Adult basic life support. *Indian J Crit Care Med*, 10(2), pp.95-104.
- Mohammed, Z., Arafa, A., Saleh, Y., Dardir, M., Taha, A., Shaban, H., AbdelSalam, E.M. and Hirshon, J.M., 2020. Knowledge of and attitudes towards cardiopulmonary resuscitation among junior doctors and medical students in Upper Egypt: cross-sectional study. *International journal of emergency medicine*, 13, pp.1-8.
- Almutairi, R.A., Alharbi, W.A., Alhazmi, M.H., Alkheraiji, D.A., Altaifi, L.A., Almohammadi, R.A. and Hammouda, S.A., *Journal Homepage:-www.journalijar.com*.
- Ralapanawa, D.M.P.U.K., Jayawickreme, K.P., Ekanayake, E.M.M. and Kumarasiri, P.V.R., 2016. A study on the knowledge and attitudes on advanced life support among medical students and medical officers in a tertiary care hospital in Sri Lanka. *BMC research notes*, 9, pp.1-11.
- Elbaih, Adel Hamed, Monira Taha, Mohamed S. Elsakaya, Amany Ali Elshemally, and Mohammed E. M. Alshorbagy. "Assessment of cardiopulmonary resuscitation knowledge and experiences between emergency department nurses hospital pre and post basic life support training course, Egypt." (2019).
- Spinelli, G., E. Brogi, A. Sidoti, N. Pagnucci, and F. Forfori. "Assessment of the knowledge level and experience of healthcare personnel concerning CPR and early defibrillation: an internal survey." *BMC cardiovascular disorders* 21, no. 1 (2021): 195.
- Aroor, Akshatha Rao, Rama Prakash Saya, Nazir Rahim Attar, Ganesh Kumar Saya, and Manikandan Ravinanthanan. "Awareness about basic life support and emergency medical services and its associated factors among students in a tertiary care hospital in South India." *Journal of emergencies, trauma, and shock* 7, no. 3 (2014): 166-169.
- [Musaed Fahad Rayzah, Salman hathal alotaibi, Abdullah Shafi Almutairi, Hammam Fahad A Alkanhal and Meshari Abdulkarim Almutairi (2019); KNOWLEDGE, ATTITUDE AND PRACTICE OF ACLS IN HEALTHCARE PROFESSIONALS AND MEDICAL STUDENTS IN MAJMAAH UNIVERSITY *Int. J. of Adv. Res.* 7 (Oct). 1093-1100] (ISSN 2320-5407). www.journalijar.com

- Nanthini, J., & Tamilvanan, R. (2022). Study on Knowledge of Cardiac Arrest and Its Management Among Health Care Professional Students in Chennai and Kanchipuram.
- Alkubati, S. A., McClean, C., Yu, R., Albagawi, B., Alsaqri, S. H., & Alsabri, M. (2022). Basic life support knowledge in a war-torn country: a survey of nurses in Yemen. *BMC nursing*, 21(1), 141.
- Mohammed, Z., Arafa, A., Saleh, Y., Dardir, M., Taha, A., Shaban, H., ... & Hirshon, J. M. (2020). Knowledge of and attitudes towards cardiopulmonary resuscitation among junior doctors and medical students in Upper Egypt: cross-sectional study. *International journal of emergency medicine*, 13(1), 19.
- Chandrasekaran, S., Kumar, S., Bhat, S. A., Shabbir, P. M., & Chandrasekaran, V. P. (2010). Awareness of basic life support among medical, dental, nursing students and doctors. *Indian journal of Anaesthesia*, 54(2), 121-126.
- Ralapanawa, D. M. P. U. K., Jayawickreme, K. P., Ekanayake, E. M. M., & Kumarasiri, P. V. R. (2016). A study on the knowledge and attitudes on advanced life support among medical students and medical officers in a tertiary care hospital in Sri Lanka. *BMC research notes*, 9(1), 462.
- Almesned, A., Almeman, A., Alakhtar, A. M., AlAboudi, A. A., Alotaibi, A. Z., Al-Ghasham, Y. A., & Aldamegh, M. S. (2014). Basic life support knowledge of healthcare students and professionals in the Qassim University. *International journal of health sciences*, 8(2), 141.
- Oteir, A. O., Kanaan, S. F., Alwidyan, M. T., Almhdawi, K. A., & Williams, B. (2021). Validity and reliability of a cardiopulmonary resuscitation attitudes questionnaire among allied health profession students. *Open Access Emergency Medicine*, 83-90.
- Alharbi, A., et al. (2024). The effectiveness of simulation-based learning on CPR knowledge and skills: A controlled study. *BMC Medical Education*.
- Alsabri, M. A. H., et al. (2024). Knowledge, attitude and perceptions of healthcare professionals in Arab countries regarding basic life support: A systematic review and meta-analysis. *Frontiers in Public Health*.
- Elendu, C. (2024). The impact of simulation-based training in medical education. *Journal of Medical Education Research*.
- Lee, P. H., et al. (2023). Using real-time device-based visual feedback in CPR improves compression quality and self-efficacy. *Resuscitation Plus*.
- Lin, Y., et al. (2025). Use of CPR feedback devices in resuscitation training. *Journal of Emergency Medicine Education*.
- Oteir, A., et al. (2025). Assessment of CPR knowledge and attitudes among allied health professionals: A cross-sectional study. *Disaster and Emergency Medicine*.
- Preuss, M., et al. (2025). Using an audiovisual feedback device improves chest compression depth in simulation manikin studies. *BMC Emergency Medicine*.
- Tomás, N., et al. (2023). Nurses' knowledge, attitudes, and practice of cardiopulmonary resuscitation: A cross-sectional study. *Journal of Nursing Education and Practice*.