



Empowering lifesavers: Impact of BLS and PALS training for PICU and critical care nurses

S. Jeevitha¹, Suresh Chelliah^{2,*}, R. Muthuvel³

¹DNB (Paediatrics) Resident, MAA Kauvery, Trichy
²Senior Consultant Paediatrician, MAA Kauvery, Trichy
³Paediatric Intensivist, MAA Kauvery, Trichy
*Correspondence

1. Background

Incidence of Cardiac Arrest in Pediatric Population;

Out-of-Hospital Cardiac Arrest (OHCA)	In-Hospital Cardiac Arrest (IHCA)
Incidence of OHCA in children 5 to 10 per 100,000 children per year Survival rates for OHCA in the pediatric population remain low (7–9%)	Incidence of IHCA: 2 to 6 per 1,000 hospital admissions Survival rates for IHCA are better: 27 – 32% surviving to hospital discharge

1.1. Importance of BLS and PALS

BLS (Basic Life Support)

First-responder interventions are critical for survival

- High-quality CPR
- Early defibrillation

PALS (Paediatric Advanced Life Support)

- Focused on systematic assessment and management of critically ill children
- Early recognition of shock and respiratory failure – to prevent IHCA
- Improves outcomes when resuscitation is needed.

1.2. Impact on ER and PICU Nurses

Pivotal in managing life-threatening situations where rapid response can significantly improve survival. Timely and accurate use of BLS and PALS protocols can increase survival rate.

Need for In-House Training

- Limited access to continuous external training
- Ability to adapt training to the specific needs of nurses and patients – ensures effective handling of emergencies
- Regular training and reassessment improve confidence in delivering life-saving interventions

1.3. Baseline Data

Group	Total no. of Nurses	Completed BLS (AHA)	Completed PALS (AHA)
ER	30	6	0
PICU	38	5	0

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*Only 20% of ER nurses and 13% of PICU nurses have completed AHA BLS training. None of them completed AHA PALS training.

2. Objectives

- To evaluate the effectiveness of the BLS and PALS training conducted in-house at Maa Kauvery Hospital for ER and PICU nurses.
- To assess the knowledge retention over time through pre-test, post-test and two-week reassessments, ensuring sustainability of critical resuscitation skills.

3. Training Overview

Training format: Program was adapted from AHA Guidelines

- The training was modelled on the American Heart Association’s (AHA) BLS and PALS programs – The gold standard in resuscitation protocols.
- BLS and PALS were modified to suit the hospital needs, focusing on key skills for frontline nursing staff

Trainers: Three consultants trained in AHA BLS and PALS

Trainees: 68 Nurses (38 from PICU and 30 from ER). They were divided into 6 batches and trained over 2 weeks

3.1. Training Schedule

BLS Training (Day 1)	PALS Training (Day 2)
Comprehensive half-day training session covering <ul style="list-style-type: none"> • Recognition of cardiac arrest. • High quality CPR for adults, children and infants. • Early defibrillation with AED. • Effective rescue breathing. • Role of teamwork in resuscitation scenarios. • Management of Choking. 	A half-day customized PALS session focusing on <ul style="list-style-type: none"> • Cardiac arrest management: Algorithms for shockable and non-shockable rhythms. • Team management skills. • Assessment of sick child. • Use of manual defibrillator.

3.2. Assessment Protocol

Pre-test: A written (15 MCQs) and practical exam was administered before the start of both BLS and PALS training

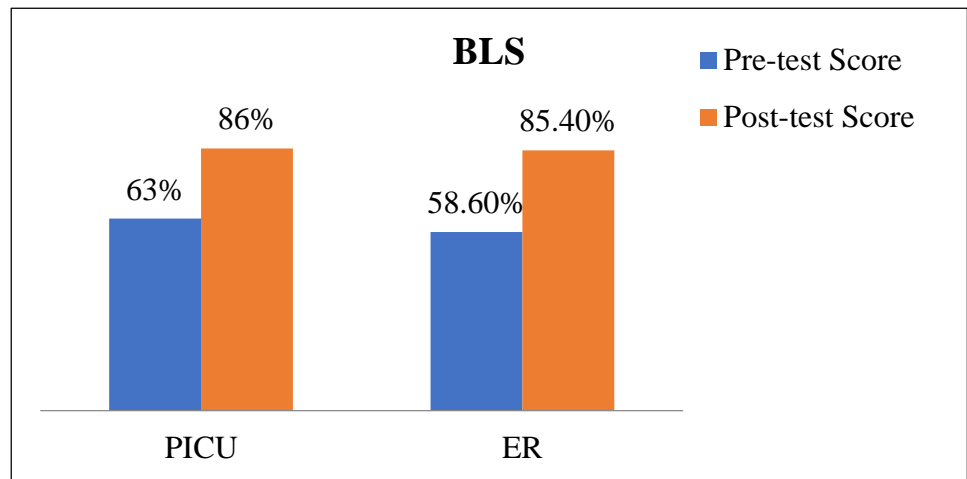
Post-test: After each day of training, nurses underwent immediate post-test (15 MCQs) to evaluate their understanding and ability to apply the skills.

Reassessment after 2 weeks: They were reassessed with both written (15 MCQs) and practical exam after two weeks to measure knowledge retention and the sustainability of practical skills

4. Results

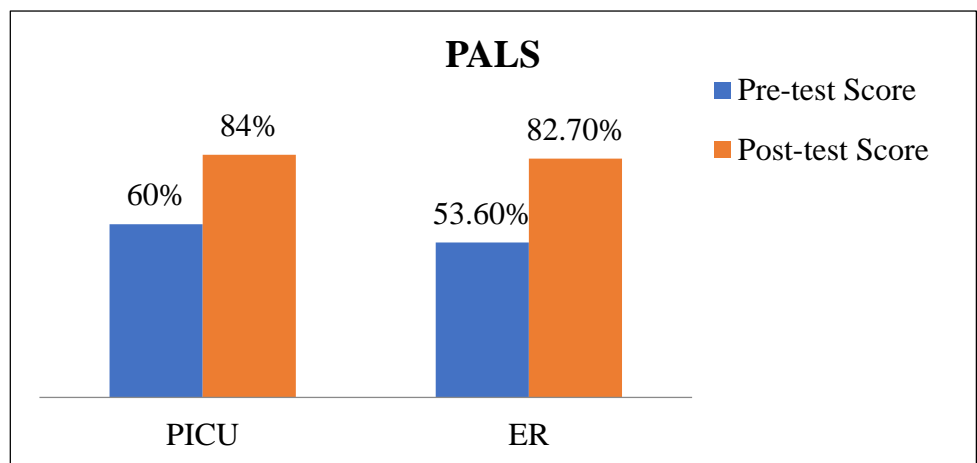
4.1. Pre-test and Post-test Performance (BLS)

Group	Number of Nurses	Average Pre-Test Score	Average Post- Test Score
PICU	38	63%	86%
ER	30	58.6%	85.4%



4.2. Pre-test and Post-test Performance (PALS)

Group	Number of Nurses	Average Pre-Test Score	Average Post-Test Score
PICU	38	60%	84%
ER	30	53.6%	82.7%



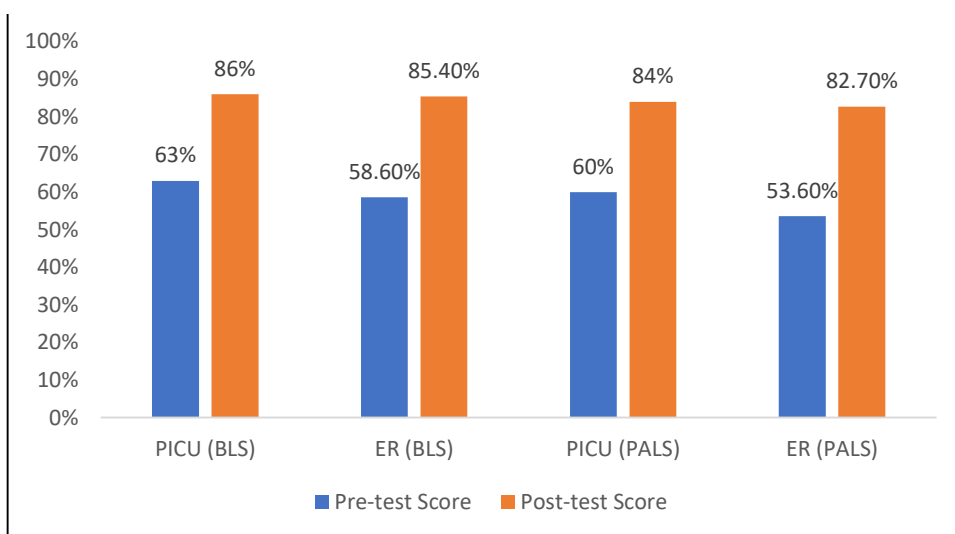
4.3. Knowledge Retention after 2 Weeks (BLS and PALS)

Group	Average Post-Test Score (%)	Average Retest Score (%)	% Retained
PICU (BLS)	86	82	95.3
ER (BLS)	85.4	76	88.9
PICU (PALS)	84	80	95.2
ER (PALS)	82.7	74	89.5

4.4. Analysis

Improvement in knowledge and skills: Pre-test vs Post-test

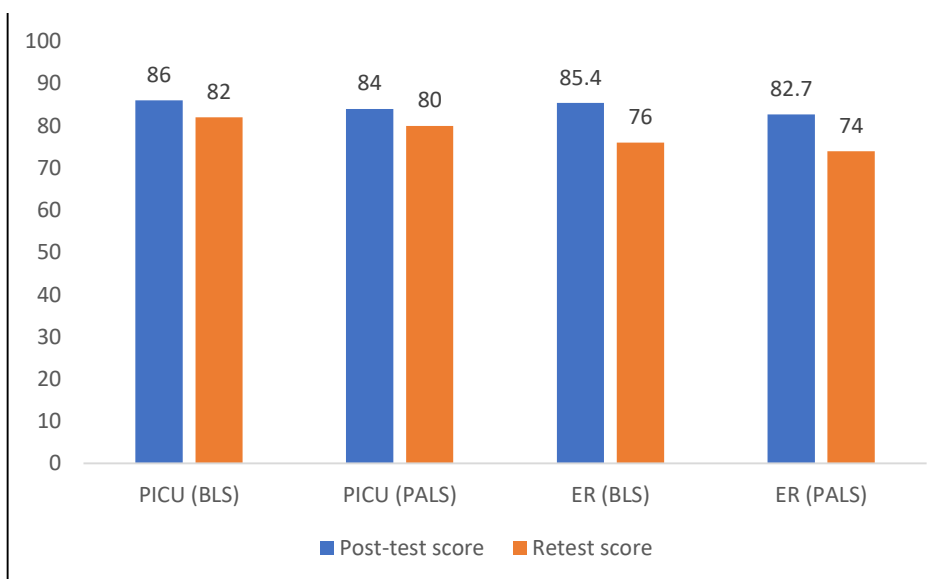
Significant improvement was observed in both BLS and PALS knowledge. The average Pre-test score was low – reflects the need for formal training in resuscitation protocols. Substantial improvement in post-test scores – effective learning and immediate application of knowledge gained.



Improvement in Knowledge and Skills: Knowledge retention

Two-week reassessment: Retest score remained around 90% of post-test score - Near complete retention of information.

PICU vs ER nurses: PICU nurses performed better in reassessment. It could be due to more frequent engagement with critical care situations in PICU.



Challenges in long-term retention

- Although retention was generally high, minor drop in BLS & PALS scores after 2 weeks
- This suggests that periodic refreshers and practice simulations are required to retain the skills obtained.

Areas for Improvement

1. Regular refresher courses

Conduct refresher training every 3-6 months to prevent skill decay & focus on critical skills like high-quality CPR and pediatric cardiac arrest management.

2. Simulation-Based Learning

Use high-fidelity simulations to improve long-term retention
Focus on team dynamics and real-life scenarios to enhance hands-on skills.

3. Team-based Drills and Role Clarity

Conduct regular interdisciplinary drills involving both PICU and ER teams to foster collaboration and improve communication.

4. Technology-Enhanced Learning (TEL)

Introduce e-learning platforms and mobile apps for ongoing education and practice between formal trainings.

5. Customized PALS for resource-limited settings

Continue with tailored PALS training focused on cardiac arrest, team communication and the systematic assessment of critically ill children.

6. Foster a culture of continuous improvement

Create an environment that values continuous improvement and incorporate regular feedback loops.