Rapid Cycle Deliberate Practice Training for Simulated Pediatric Asystole Incorporated in Emergency Department Continuing Education

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INTRODUCTION

There are over 20,000 incidents of cardiac arrest among the pediatric population in the United States every year (American Heart Association, 2020). Delays in cardiopulmonary resuscitation, time to defibrillation, or time to first epinephrine administration can decrease survival rates (Rasper, J., Khoury, C., Marshall, A., et al., 2024). During the first five minutes of cardiac arrest, nurses must quickly identify a pulseless patient and initiate lifesaving interventions.

Rapid cycle deliberate practice (RCDP) is a simulation approach that allows learners to repeat a scenario multiple times with short debriefings between cycles. This study examines the implementation of RCDP training for pediatric emergency department nurses and its impact on improving the time to delivery of six essential nursing code skills.

AIM

This project aimed to determine whether RCDP training improves nurse preparedness and actions in pediatric code situations. By conducting these rapid cycle simulations, nurses had the opportunity to practice different roles during a code and enhance their efficiency in providing lifesaving care.

Additionally, this project sought to demonstrate how repeated simulation can help nurses retain information and improve their clinical practice. By focusing on six essential nursing code skills, nurses were able to rotate through multiple code roles, gaining a deeper understanding of how to optimize performance in real-life scenarios. The goal was to achieve a measurable improvement in the time it takes to initiate critical interventions.

METHOD

Pediatric code education was conducted with 56 emergency department registered nurses, divided into 14 groups, over a nine-month period. Nurses first participated in classroom education sessions covering six essential code skills: pulse check, compressions, ventilation, weight estimation using weight-based tape, rhythm identification after appropriate defibrillator pad placement, and weight-based epinephrine dosing.

After completing a two-hour educational course, nurses engaged in three rounds of rapid cycle simulations to assess skill efficiency. They were assigned various roles, including documenter, bedside nurse, medication administration nurse, and defibrillator operator. The same simulation scenario was repeated sequentially for three rounds, with a brief debriefing between cycles.

Times were recorded for the six variables; the identification of pulselessness, initiation of compressions, initiation of ventilations, weight estimation using weight-based tape, rhythm identification after proper defibrillator pad placement, and administration of a weight-based epinephrine dose. A proctor timed all sessions, starting the clock when the scenario was read, then marking when each intervention was completed. Nurses were randomly assigned roles and switched roles after each round.

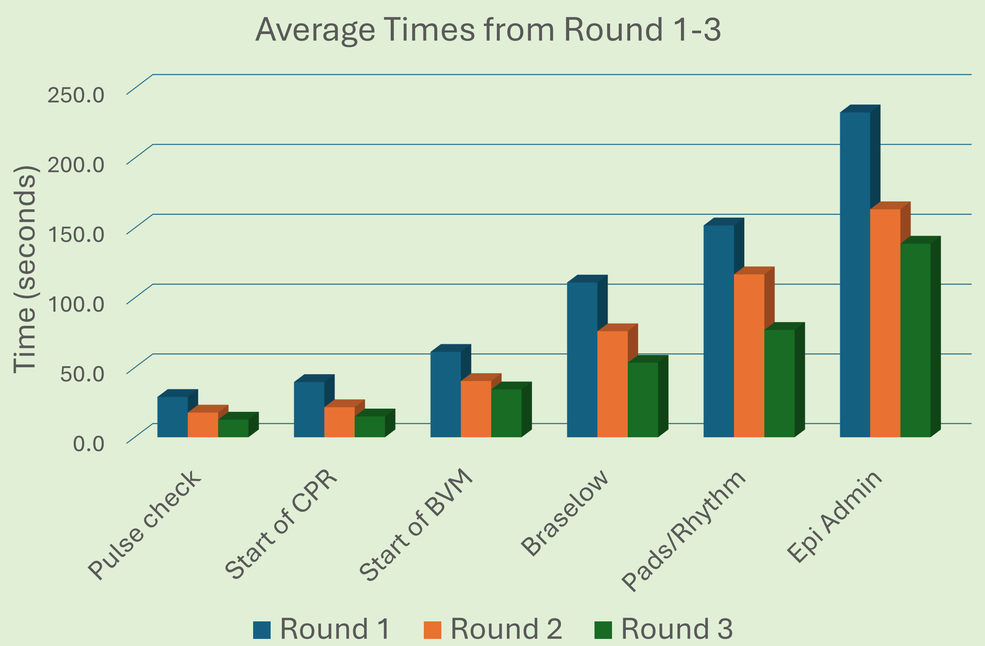
Variables being Measured

1. Time until pulse check
2. Time until start of CPR compressions
3. Time until application of a Bag-Valve-Mask for ventilation
4. Time until Braselow weight obtained
5. Time until application of defibrillator pads and rhythm identification
6. Time until first dose of Epinephrine 0.1mg/mL

RESULTS

The results demonstrated overall improvements in all six variables from round one to round two, followed by further improvement from round two to round three. Even when skill times did not improve between rounds two and three, they still showed overall improvement compared to round one. Additionally, all average times improved from round one to round two and from round two to round three.

	Improvement from Round 1 to Round 2	Improvement from Round 2 to Round 3	Improvement from Round 1 to Round 3
Pulse check	71%	79%	86%
Start of CPR Compression	86%	86%	100%
Start of BVM Ventilation	86%	71%	100%
Braselow measurement	86%	93%	86%
Zoll Pads Application	64%	93%	86%
Epinephrine Administration	100%	71%	93%



CONCLUSION

Rapid cycle deliberate practice helps nurses refine the skills needed during a code situation. The simulation provided nurses with the opportunity to practice various roles they may encounter in real-life scenarios. By allowing learners to immediately repeat the simulation and make improvements, they can develop and strengthen life-saving skills. The overall improvement from round to round demonstrates how rapid cycle simulations enhance nursing care and lead to better patient outcomes.

LIMITATIONS

Limitations included the randomization of skill mix within each group. This study did not control for the ratio of novice to expert nurses or the experience level of the primary nurse in round one. Future studies can explore how the skill mix of participants impacts overall outcomes.

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