

Increasing Pulmonary Artery Catheter Education Among CCU Nurses: A Quality Improvement Project

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Background & Significance

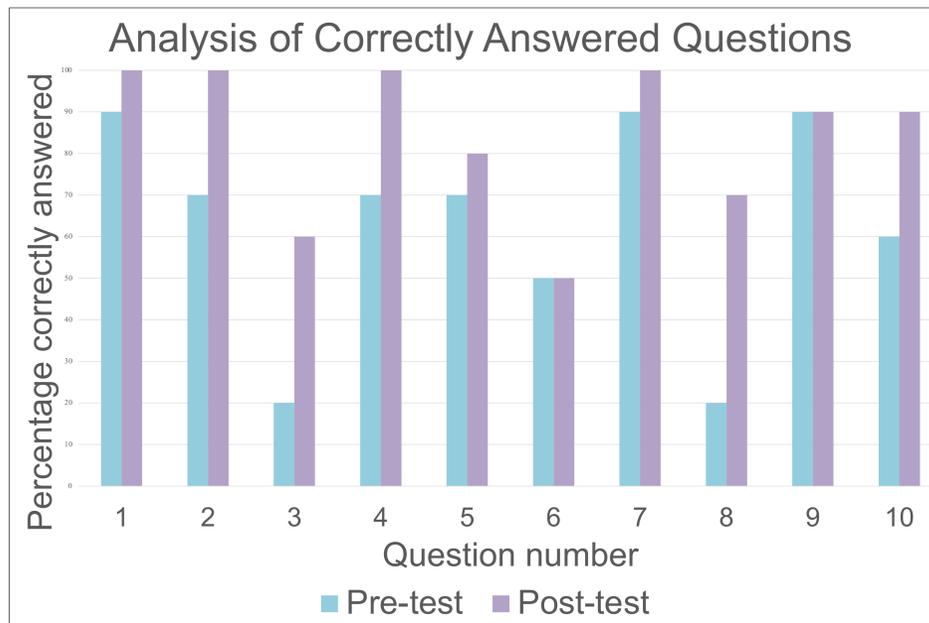
Commonly used in cardiac critical care, pulmonary artery (PA) catheters are central venous access devices that provide information about the functionality of the heart². They require specialized skills to manage appropriately, without which serious, even fatal complications can occur². Multiple studies report incorrect measurement of values derived from PA catheters in the absence of specific training.

Problem & Purpose Statement

There is no routine ongoing education dedicated specifically to PA catheter management after orientation in the cardiac care unit (CCU) at a large academic medical center in Seattle. Sufficient evidence demonstrates the effectiveness of content-specific training programs for improving knowledge of PA catheters, central lines, and hemodynamics. The intent of this project was to determine whether a program focused on appropriate PA catheter use, management, and troubleshooting techniques would help improve nursing knowledge regarding PA catheter management.

Methods

A PA catheter education program and an identical pretest and posttest were developed from published or validated resources. Concepts covered in the module include expected standards of care, a brief overview of the basics of PA catheter management, the process of measuring hemodynamic values, and the mechanics of measuring end-expiration and its significance. Test questions for the pretest and posttest that demonstrated knowledge of these topics were chosen. Ten CCU charge nurses participated in the pretest, intervention, and posttest. Tests were scored and compared to assess change in knowledge. Descriptive statistics of the paired data were calculated and analyzed quantitatively for change.



PA catheter knowledge among CCU nurses increased with statistical significance after implementation of the education program



Note: The columns demonstrate mean test scores, while the vertical brackets demonstrate the 95% confidence interval

Results & Outcomes

Significant improvement was recognized after participants engaged in the education program. Answer variability decreased, the mean test score increased from 0.63 to 0.84, and a p-value of 0.01 resulted demonstrating statistical significance. This effectively demonstrates that CCU nurse knowledge of PA catheters and their management improved.

Sustainability

The PA catheter education program will be used to educate nurse 'super-users' who can serve as resources to those with questions. Interdisciplinary interest has been expressed as well. A wider array of health professionals will be educated using this training including physicians, advanced practice nurses, and physician assistants. This program is also inherently valuable within this institution due to a lack of scholarly published resources dedicated to PA catheters.

Implications

Increased PA catheter knowledge among project participants indicates not only that the program content itself was efficacious at educating nurses; it demonstrates that the program will likely be successful at educating other interdisciplinary staff as well. Since inaccurate measurement of hemodynamic values obtained from a PA catheter is associated with increased mortality in critically ill patients, the results also imply that patients will receive safer and more effective care, thus improving patient care outcomes¹.

References

- ¹Claire-Del Granado, R. Mehta, R.L. (2016). Fluid overload in the ICU: Evaluation and management. *BioMed Central Nephrology*, 17(109). <https://doi.org/10.1186/s12882-016-0323-6>
- ²Von Rueden, K.T. (2020). Bridging the gap between clinic practice and the AACN practice alert on pulmonary artery/central venous pressure monitoring in adults. *AACN Advanced Critical Care*, 31(1), 34-40. <https://doi.org/10.4037/aacnacc2020888>