

Improving Nursing Knowledge and Self-Efficacy with IV Prostacyclin Administration

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Background

- Pulmonary Arterial Hypertension (PAH) is a rare and serious disease affecting the heart and lungs
- PAH can be managed inpatient with IV prostacyclins
- IV prostacyclins are high-risk, low frequency medication that poses significant safety hazards if used in error
- A lack of standardized procedures and education related to nursing administration of IV prostacyclins has led to a knowledge gap with its administration

Purpose & Aims

Purpose: To determine if an educational module improves nursing knowledge and self-efficacy with the administration of IV prostacyclins in an ICU setting.

The study aims are:

- **Aim 1:** To improve nursing knowledge of IV prostacyclin administration by 20%
- **Aim 2:** To improve nursing self-efficacy of IV prostacyclin administration by 20%
- **Aim 3:** Evaluate satisfaction with the educational intervention as part of a continuing education program

Methods

Design: Quasi-experimental, pre/post intervention

Setting: Large urban academic medical center in the Northeast United States

Sample: Convenience sample of MICU RNs

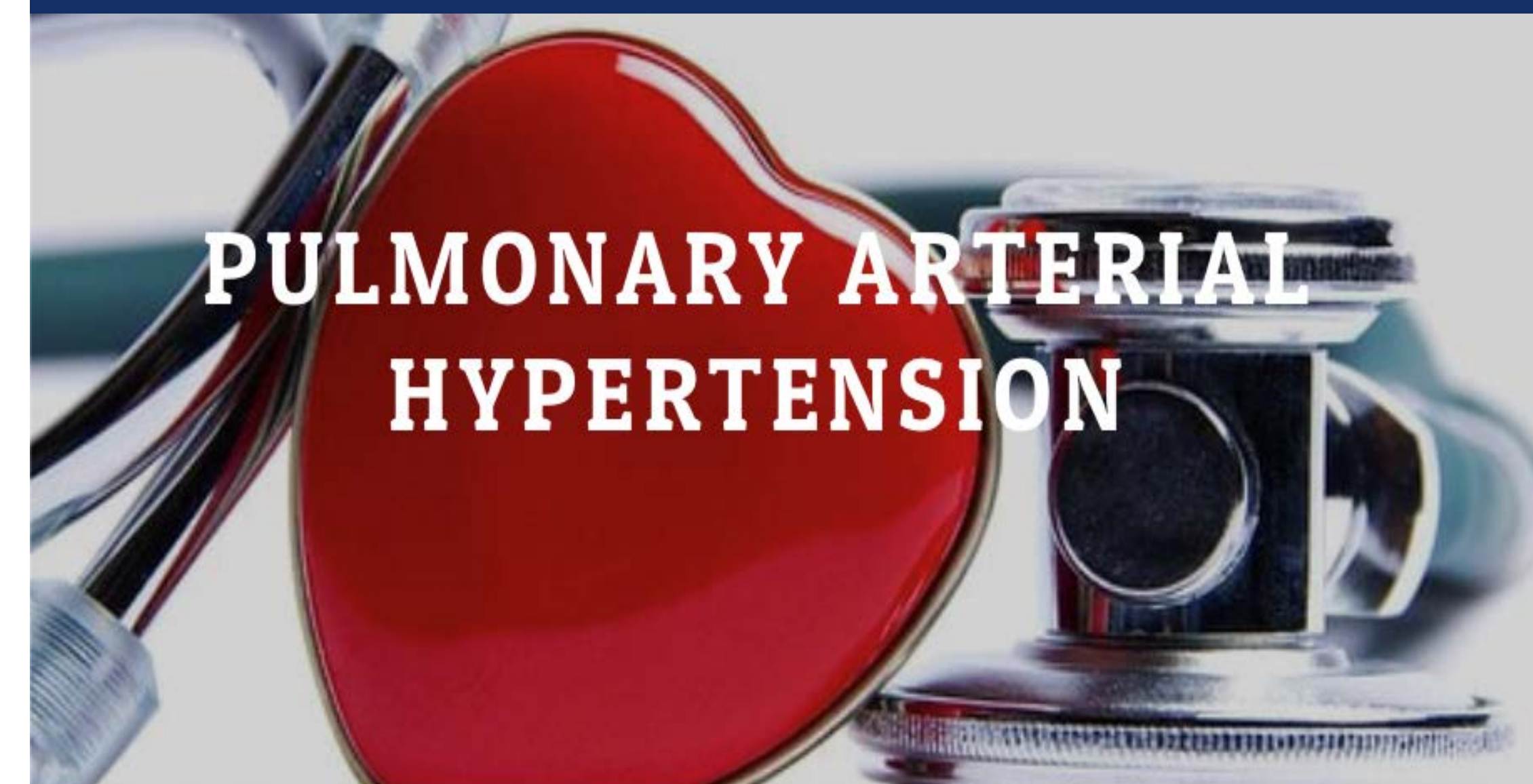
Measures: (a) Modified Nurses' Knowledge of High Alert Medications; (b) Modified Learning Self-Efficacy Scale (L-SES); (c) Self-developed Satisfaction Survey^{1,2}

Analysis: Descriptive statistics & Wilcoxon-Signed Rank

References

1. Hsaio, G.Y., Chen, I.J., Yu, S., Wei, I.L., Fang, Y.Y., & Tang, F.I. (2009) Nurses' knowledge of high-alert medications: instrument development and validation. *Journal of Advanced Nursing*, 66(1), 177-190. doi: 10.1111/j.1365-2648.2009.05164
2. Kang, Y-N., Chang, C-H., Kao, C-C., Chen, C-Y., & Wu, C-C. (2019). Development of a short and universal learning self-efficacy scale for clinical skills. *PLoS ONE*, 14(1), 1-11. <https://doi.org/10.1371/journal.pone.0209155>

Intervention



- Independent web portal
- 30-minute online module
 - Background and definitions
 - Pathophysiology of PAH
 - IV prostacyclin management
- Three didactic videos
- Two video demonstrations
- Optional teach-back sessions

Sample Characteristics

- A total of 21 nurses participated, the majority (n=21, 95%) of whom were full-time employees. See Figures 1 & 2 for additional demographics.

Figure 1. RN Years of Experience

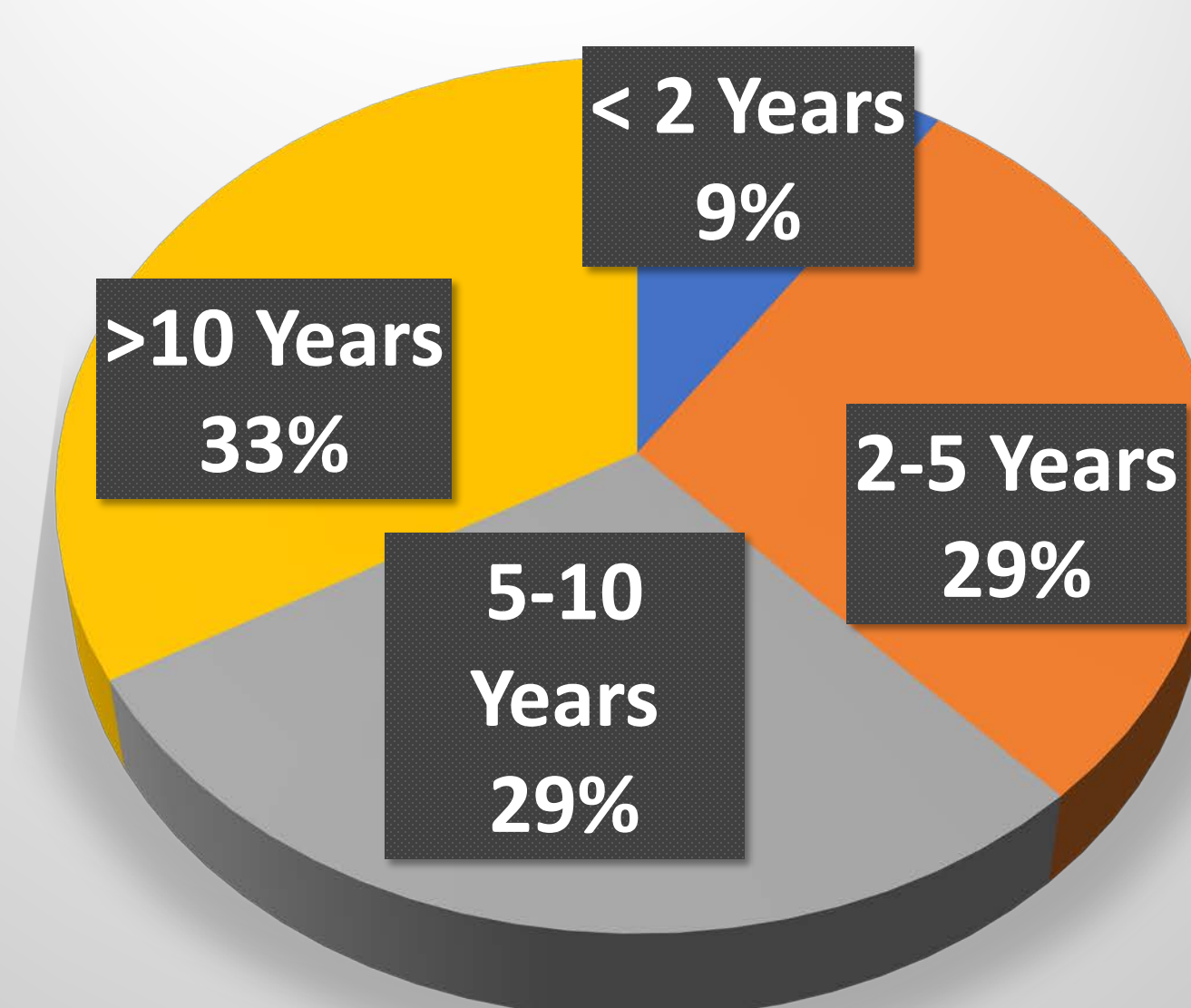
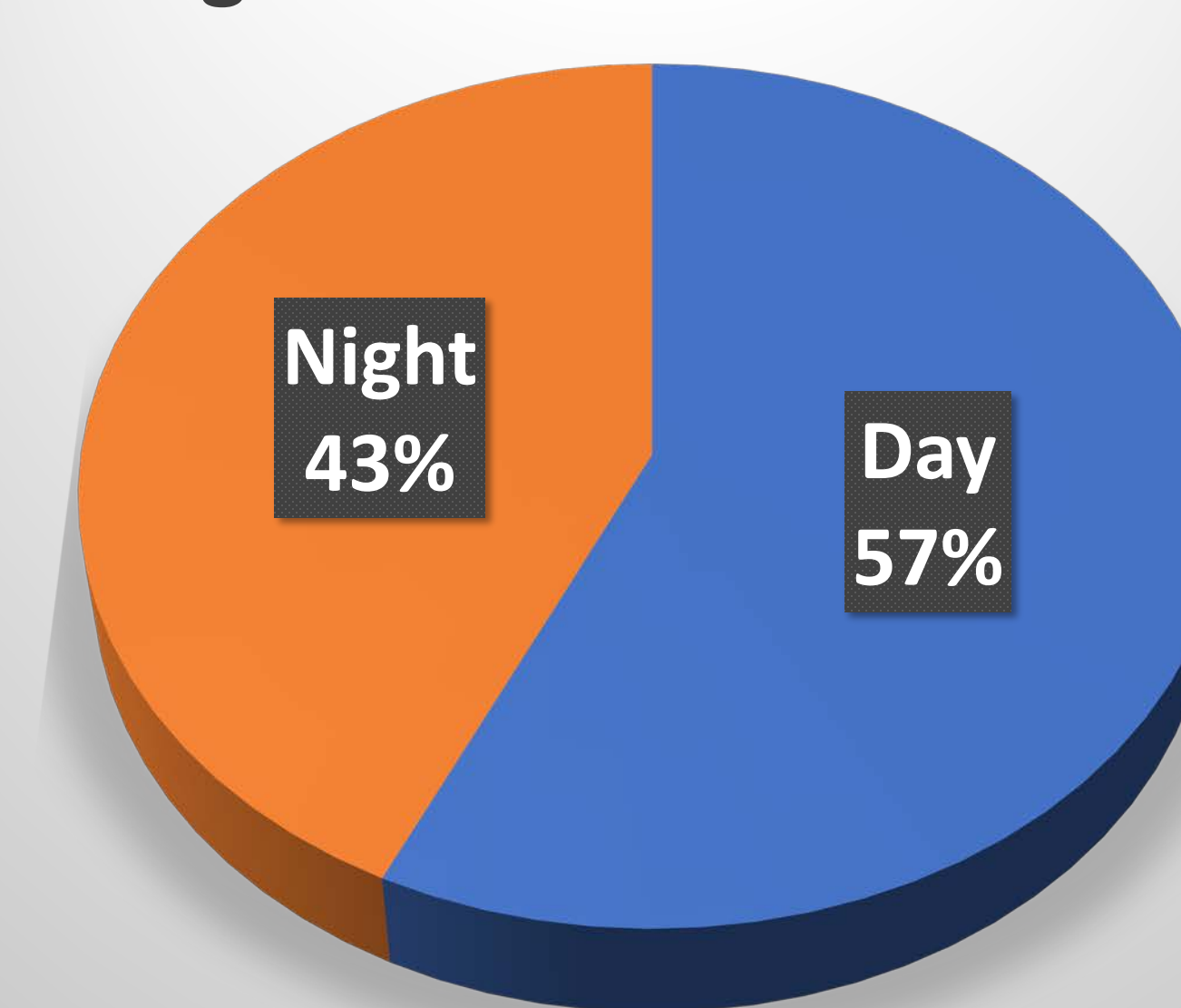


Figure 2. RN Shift Worked



Aim 1 & 2 Results

- There was an 18.75 percent change increase in knowledge and a 2% median increase in cognitive self-efficacy after the intervention. See Table 1 for details.

Table 1. RN Survey Results for Aims 1 & 2

| Item | Pre-test Median (IQR) | Post-test Median (IQR) | Z | p-value |
|------------------------|-----------------------|------------------------|-------|---------|
| Aim 1: Nurse Knowledge | 80 (5) | 95 (5) | -3.88 | <0.01 |
| Aim 2: Self-Efficacy | | | | |
| Cognitive | 15 (3) | 18 (3) | -3.58 | <0.01 |
| Affective | 14 (2.5) | 14 (3) | -1.88 | 0.06 |
| Psychomotor | 16 (1) | 16 (1.5) | -2.5 | <0.05 |

Aim 3 Results

- 100% (N=21) of the participants agreed or strongly agreed with all five satisfaction questions. See Table 2 for details.

Table 2. Satisfaction Survey Results

| Question Text | N = 21 (100%) |
|---------------------------------------|---------------|
| Easy to access educational module | |
| Agree | 4 (19) |
| Strongly Agree | 17 (81) |
| Appropriate for my nursing experience | |
| Agree | 7 (33.3) |
| Strongly Agree | 14 (66.7) |
| Knowledge Improved from training | |
| Agree | 11 (52.4) |
| Strongly Agree | 10 (47.6) |
| Comfortable with Administration | |
| Agree | 14 (66.7) |
| Strongly Agree | 7 (33.3) |
| Utilize Information for Practice | |
| Agree | 12 (57.1) |
| Strongly Agree | 9 (42.9) |

Conclusion

An online educational module is an effective training strategy to improve nursing knowledge and self-efficacy with IV prostacyclin administration

Sustainability

- Continued use of the educational modules by MICU as a training and reference
- Potential integration into annual nursing competencies
- Evaluation for use on cardiac service line

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