Using Simulation to Demonstrate Competency and Build Confidence in Sepsis Recognition and Utilization of a Nurse-Driven Sepsis Protocol

Sophia Pan BSN, RN, CCRN-CSC[1]; Leslie Rowan, DNP, RN, CNL, CWCN[2]; Mojgan Azadi, DNP, Ph.D, MSN, RNC, CNE cl[1]
[1]Johns Hopkins University School of Nursing; [2]Washington D.C. Veterans Affairs Medical Center
Email: span16@jh.edu

JOHNS HOPKINS SCHOOL of NURSING

BACKGROUND

- Sepsis is the leading cause of death in hospitalized patients in the U.S., accounting for: 220,000 deaths per year, $17 billion in healthcare costs, and a mortality rate of 25-50% [1].
- Patients hospitalized outside of the intensive care unit (ICU) are twice as likely to die from lack of timely recognition [2], and each hour delay in antibiotic administration decreases likelihood of survival by 7.6% [3].
- Need to focus on early recognition by the nurse and bedside screening with the quick Sepsis Organ Failure Assessment (qSOFA), intended for screening patients outside the ICU [4]
- The project site had a higher than desired sepsis mortality rate and significantly delayed antibiotic administration time

LITERATURE REIVEW

- Sepsis simulation was effective in improving sepsis-related knowledge in nurses and reinforcing evidence-based practice guidelines [5]
- Nurses' feelings of competence in caring for septic patients increased [6, 7]
- Positive correlation found between the number of nurses who went through simulation, and timely delivery of sepsis bundle interventions [8]

PROJECT PURPOSE & AIMS

Purpose: To utilize simulation education to evaluate adult medical-surgical nurses' competence and build confidence in early sepsis recognition using qSOFA, utilization of a nurse driven sepsis-protocol, and the effect on the average time to antibiotic administration.

Aim 1: To evaluate nurses' knowledge with a post-intervention knowledge assessment
Aim 2: To determine the confidence of nurses using a Likert-based scale
Aim 3: To determine the average time to antibiotic administration for identified septic patients, as measured by chart review for 16 weeks following the intervention

METHODS

- **Study design**: Quality improvement project; post-test only design
- **Setting:** 28-bed adult medical-surgical telemetry unit within an urban government medical center providing tertiary care to Veterans
- **Sample:** 30 nurses in the adult medical-surgical unit; 81% participation rate
- **Statistical analysis:** Descriptive statistics
- **Intervention:** 30-minute high-fidelity simulation implemented over 6 weeks
- **Measures**
  - 9-question knowledge assessment developed from facility protocol
  - 6-question 5-point Likert scale confidence instrument; modified from NLN's "Student Satisfaction and Self-Confidence in Learning" instrument [9]
  - Facility chart review of sepsis cases on the unit

RESULTS

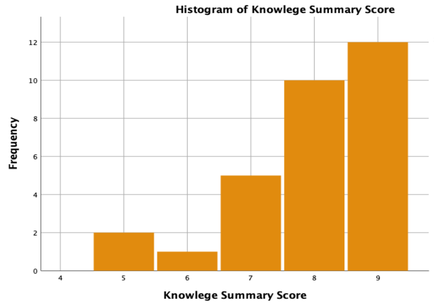

Figure 1: Knowledge score distribution

Aim 1: Knowledge

- Mean score: 7.97 of 9 (SD = 1.16)
- Of the 30 RNs, 27 (90%) achieved passing score of 7 of 9 or higher

Aim 2: Confidence

- Mean summary score: 27.05 of 30 (SD = 3.5)
- Of the 30 RNs, 27 (90%) had a summary score of ≥ 24, indicating they felt favorably on all items
- No qualitative responses reported

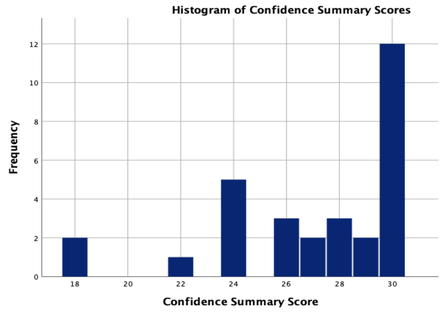

Figure 2: Confidence summary scores

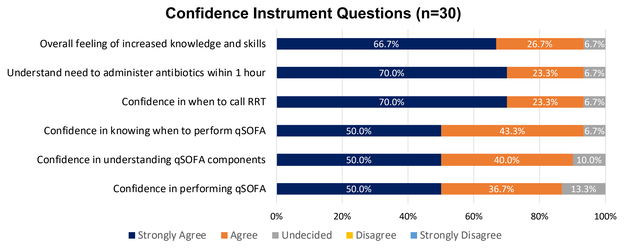

Figure 3: Itemized confidence instrument results

- For each item, >80% of responses were favorable (strongly agree or agree)
- No negative responses

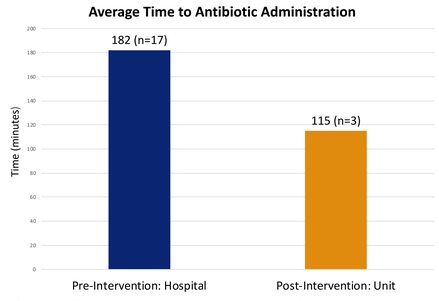

Figure 4: Pre and post-intervention antibiotic times

Aim 3: Screening and Time to Antibiotic

- Total of 3 identified cases of sepsis through the rapid response team
- Average time to antibiotic was 115 minutes (n=3)
- Decrease of 67 minutes from prior hospital average (n=17)

DISCUSSION

- Nurses were able to demonstrate skill and knowledge competency for qSOFA screening, and felt confident in their abilities to screen for, recognize, and treat sepsis
- Preliminary chart review showed improvements in time to antibiotic
- Due to favorable findings on this pilot unit, it is recommended that this simulation be used in other units in the hospital, and further integrated into the organization's existing continual "Emergency Mock" education
- Limitations
  - Small sample size
  - Baseline knowledge and confidence not captured due to study design
  - Knowledge assessment tool is organization-specific
  - COVID-19 pandemic limiting usual unit census and operations; limited ability to assess true clinical impact of the intervention
- Further studies needed with larger number of participants and longer evaluation time period to assess impact on patient outcomes and knowledge/skill retention

CONCLUSION

- Simulation can be an effective educational methodology to implement alongside traditional teaching methods
- Active, engaged learning can allow the learner to demonstrate competency and feel confident in new skills and the clinical application of knowledge
- This project is being used to inform a secondary DNP project at the facility, which is already currently underway

ACKNOWLEDGMENTS

- Elaine Sherman, MSN, RN
- Charmaine Wilson, MSN, RN
- Erica Wilson, MSN/Ed, BS, RN, CM/DN, COHC, CNOR
- 3E Nursing Staff

REFERENCES

1. The Joint Commission. (2020). Sepsis. https://www.jointcommission.org/resources/patient-safety-topics/infection-prevention-and-control/sepsis
2. Gyang, E., Shieh, L., Forsey, L., & Maggio, P. (2016). A nurse-driven screening tool for the early identification of sepsis in an intermediate care unit setting. *Journal of Hospital Medicine, 10*(2), 97-103. doi: 10.1002/jhm.2291
3. Kumar, A., Roberts, D., Wood, K. E., Light, B., Parrillo, J. E., Sharma, S., Suppes, R., Feinstein, D., Zanotti, S., Taiberg, L., Gurka, D., Kumar, A., & Cheang, M. (2006). Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock. *Critical Care Medicine, 34*(6), 1589-1596. doi: 10.1097/01.CCM.0000217961.75225.E9
4. McCaffery, M., Onikoyi, O., Rodrigopulle, D., Syed, A., & Jones, S. (2016). Sepsis-review of screening for sepsis by nursing, nurse driven sepsis protocols and development of sepsis hospital policy/protocols. *Nursing and Palliative Care, 1*(2), 33-37.
5. Aebersold, M. (2011). Using simulation to improve the use of evidence-based practice guidelines. *Western Journal of Nursing Research, 33*(3), 296–301.https://doi.org/DOI:10.1177/0193945910379791
6. Brown, N., Darby, W., & Coronel, H. (2019). An escape room as a simulation teaching strategy. *Clinical Simulation in Nursing, 30*, 1–6. https://doi.org/10.1016/j.ecns.2019.02.002
7. Delaney, M. M., Friedman, M. I., Dolansky, M. A., & Fitzpatrick, J. J. (2015). Impact of a sepsis educational program on nurse competence. *Journal of Continuing Education in Nursing, 46*(4), 179–186. https://doi.org/10.3928/00220124-20150320-03
8. Kumar, A., Roberts, D., Wood, K. E., Light, B., Parrillo, J. E., Sharma, S., Suppes, R., Feinstein, D., Zanotti, S., Taiberg, L., Gurka, D., Kumar, A., & Cheang, M. (2006). Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock. *Critical Care Medicine, 34*(6), 1589-96.
9. Student Satisfaction and Self Confidence in Learning [PDF]. (2005). http://www.nln.org/docs/default-source/default-document-library/instrument-2_satisfaction-and-self-confidence-in-learning.pdf?sfvrsn=0