

Improving Nurse Satisfaction and Patient Outcomes Through Sepsis Simulation Education



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Background & Review of Literature

- Sepsis remains the leading cause of death among hospitalized patients⁴
- At this institution,
 - Patients over the age of 60 were identified as having a mortality rate of 27-43%
 - The average time to administration of antibiotics was 182-265 min.
- Common themes from the literature include:
 - There is an association between decreased knowledge and experience with sepsis and increased time to antibiotic administration^{1,5}
 - Rapid response teams decrease time to administration of antibiotics and increase appropriateness of first dose of antibiotics⁶
 - Simulation education provides a safe learning environment to participate in emergency situations^{2,7}
 - Sepsis simulation has been shown to empower nurses to escalate concerns and initiate treatment earlier, and increase compliance with sepsis bundle completion³

Methods

- Design:** Pilot Quality Improvement Project with Pre/Post-Test Design
- Setting:** Medical-Surgical Unit in a hospital in the Northeast
- Intervention/Measurement:** Sepsis Simulation Education from the NLN; Sepsis Knowledge Survey, Nursing Self-Confidence Survey, and data abstraction of number of RRTs

Table 1. Baseline Demographics of Nurses

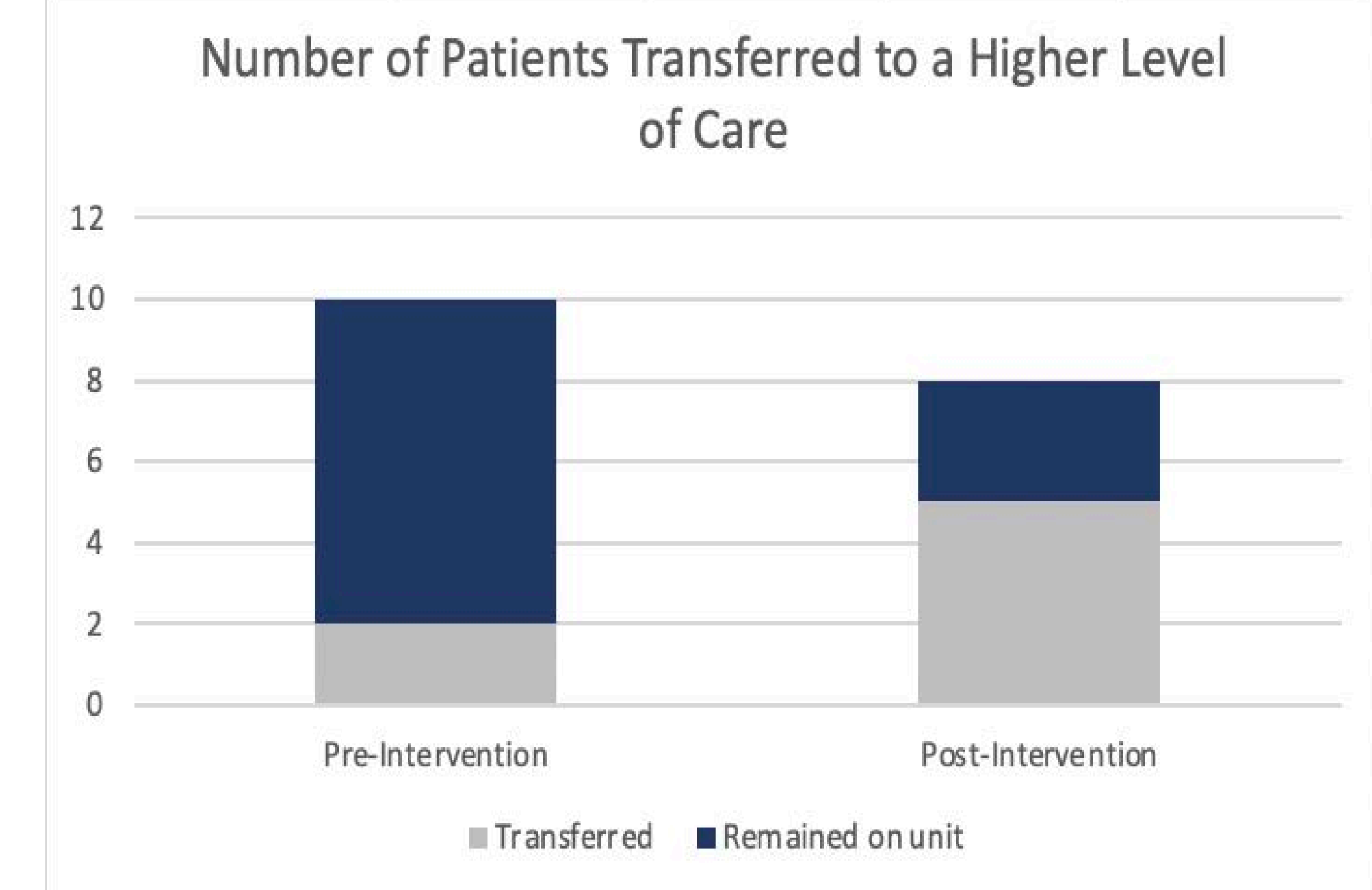
Demographic Characteristics	(N=19)
Years of Experience, n (%)	
0-5	4 (21.1)
6-10	5 (26.3)
11-19	6 (31.6)
20+	4 (21.1)
Age, n (%)	
20-29	0 (0)
30-39	4 (21.1)
40-49	6 (31.6)
50+	9 (47.4)
Level of Education, n (%)	
ADN	3 (15.8)
BSN	10 (52.6)
MSN	4 (21.1)
PhD/DNP	2 (10.5)
Prior Experience Participating in Simulation, n (%)	
Yes	7 (36.8)
No	12 (63.2)
Prior Experience Caring for Septic Patients, n (%)	
Yes	7 (36.8)
No	12 (63.2)

- Sample:**

Results

- Aim 1:**
 - Pre-Test scores (Mean, SD): 4.74 (1.40)
 - Post-Test scores: 4.88 (2.93)
 - A Wilcoxon signed-rank test indicated that there was no statistical significance ($Z=-0.489$, $p=0.625$, r score $=-0.11$).
 - The intervention had a small effect.
- Aim 3:**
 - Pre-Test score: 18.78 (6.89)
 - Post-Test score: 26.68 (5.03)
 - A Wilcoxon signed-rank test indicated that there was a statistical significance ($Z=-3.272$, $p=0.001$, r score $=-0.75$).
 - The intervention had a large effect.

- Aim 2:**



- Pre-Intervention: 20% (2/10) of patients were transferred
- Post-implementation: 62.5% (5/8) of patients were transferred
- The number of patients screened with qSOFA was unable to be obtained.

Purpose & Aims

- Purpose:** Evaluate efficacy of simulation education, increase nursing self-confidence in implementing the sepsis protocol, and improve compliance with the nurse-driven sepsis protocol
- Aims:**
 - Improve compliance with a nurse-driven sepsis protocol by measuring pre/post-test scores using a Sepsis Knowledge Survey
 - Increase number of patients screened with qSOFA and utilization of a rapid response team
 - Evaluate usage and satisfaction of the nurse-driven protocol by measuring pre/post scores using a Nursing Self-Confidence Survey

Strengths & Limitations

- Strengths:**
 - Increased nursing self-confidence in caring for septic patients
- Limitations:**
 - Small sample size; not generalizable to other populations
 - Nursing unfamiliarity with equipment and vital sign presentation
 - Inability to analyze number of patients screened with qSOFA pre/post-intervention
 - Lack of responses on 6 week post-intervention survey did not allow for analysis of knowledge retention

Dissemination & Conclusion

- Implementing sepsis simulation education increases nursing self-confidence in caring for septic patients
- Dissemination:**
 - Results will be disseminated with institutional stakeholders and nursing leaders on participating units to continue implementation of sepsis simulation as part of nursing education
 - Manuscript will be submitted to a nursing journal for publication
- Sustainability**
 - Simulation education is able to be sustained due to feasibility in continuing education and minimal use of resources.
 - Sepsis simulation education is able to be continued on this unit, and may be adapted by other med-surg units at the institution as well

¹Amaral, A. (2016). Patient and organizational factors associated with delays in antimicrobial therapy for septic shock. *Critical Care Medicine*, 44(12), 2145-2153. <https://doi.org/10.1097/CCM.0000000000001868>

²Davis A. H., Hayes S. P. (2018). Simulation to manage the septic patient in the intensive care unit. *Critical Care Nursing Clinics of North America*, 30(3), 363–377. <https://doi.org/10.1016/j.cnc.2018.05.005>

³Herron, J., Harbit, A., & Dunbar, J. (2019). Subduing the killer—Sepsis: Through simulation. *BMJ Evidence-Based Medicine*, 24(1), 26–29. <https://doi.org/10.1136/bmjebm-2018-110960>

⁴Joint Commission (2014). Reducing sepsis mortality. *Joint Commission Center for Transforming Healthcare*. <https://www.centerfortransforminghealthcare.org/improvement-topics/reducing-sepsis-mortality/>

⁵Li, X., Xie, J., Zhu, Y., Zhou, J., Qian, S., Sun, Q., ... Yang, Y. (2018). Nursing staff capacity plays a crucial role in compliance to empiric antibiotics treatment within the first hour in patients with septic shock. *Chinese Medical Journal*, 132(3), 339-341. <https://doi.org/10.1097/CM9.0000000000000073>

⁶Stritch, J., Heil, E., Masur, H. (2020). Considerations for empiric antimicrobial therapy in sepsis and septic shock in an era of antimicrobial resistance, *The Journal of Infectious Diseases*, 222 (2): S119–S131, <https://doi.org/10.1093/infdis/jiaa221>

⁷Vanderzwan, K., Obrecht, J., Johnson, A., Schwind, J., & O'Rourke, J. (2020). Using simulation to evaluate nurse competencies. *Journal for Nurses in Professional Development*, 36(3). <https://doi.org/10.1097/NND.0000000000000630>