



Featured Article

Improving Nurses' Vasopressor Titration Skills and Self-Efficacy via Simulation-Based Learning

Kristin Lavigne Fadale, DNP, ARNP, FNP-C^{a,*}, Denise Tucker, DSN, RN, FNP-C, CCRN^a, Jennifer Dungan, PhD, RN^{b,1}, Valerie Sabol, PhD, ACNP-BC, GNP-C^{b,1}

^aCollege of Nursing, Florida State University, Tallahassee, Florida

^bSchool of Nursing, Duke University, Durham, North Carolina

KEYWORDS

simulation;
vasopressor;
performance;
self-efficacy;
nurse;
advanced nursing skills

Abstract

Background: Administration of vasopressors in patients with septic shock can be a difficult skill for nurses to learn. Simulation-based learning (SBL) may be a useful tool for improving nurses' self-efficacy and skill performance in this context.

Methods: The purpose was to determine if an SBL experience increases nurses' self-efficacy and performance across three time points, using a quasi-experimental pre-post test design.

Results: We identified statistical trends in 16 RNs for improvement in self-efficacy (general and situational) and performance over time.

Conclusions: SBL training demonstrated an effect on self-efficacy and performance. Additional research is needed to confirm these findings.

Cite this article:

Fadale, K. L., Tucker, D., Dungan, J., & Sabol, V. (2014, June). Improving nurses' vasopressor titration skills and self-efficacy via simulation-based learning. *Clinical Simulation in Nursing*, 10(6), e291-e299. <http://dx.doi.org/10.1016/j.ecns.2014.02.002>.

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Sepsis is an inflammatory response to infection by the body. It is a significant health problem, evidenced by more than doubling of sepsis-related hospital admission rates from 2000 to 2008, up to 75% longer length of hospital stay for sepsis patients, eight times greater likelihood of death, and treatment costs exceeding \$14 billion annually in the United States (Hall, Williams, DeFrances, & Golosinskiy, 2011). Collaborative interventions for hemodynamically unstable patients with septic shock include volume replacement and the use of IV vasopressor

medications titrated to specific hemodynamic parameters (Dellinger et al., 2013). Titration of vasopressors by nurses is a critical skill in the proper management of the patient with hemodynamic instability in septic shock and is often a difficult skill to master owing to the complexities of initiating the vasopressor properly while monitoring multiple physiological parameters. Careful administration and monitoring are important for preventing detrimental side effects to patients, such as cardiac arrhythmias and ischemic limbs (Bockenstedt, Baker, Weant, & Mason, 2012; Hollenberg, 2007). The critically ill patient may be at further risk for adverse events during the common practice of nurses learning IV vasopressor titration skills by on-the-job training.

¹Equal Senior Authorship.

* Corresponding author: kristin.fadale@me.com (K. L. Fadale).

Simulation-Based Learning

Simulation-based learning is a teaching method that allows the learner to become immersed in an interactive, realistic environment where skills, knowledge, and attitudes can be developed without risk to

Key Points

- Varied training and low self-efficacy may impact the ability of registered nurses to master vasopressor administration.
- A pilot project evaluated the effects of a simulation-based learning protocol for vasopressor administration for septic shock.
- Our pilot results suggest a potential for simulation-based learning to improve and maintain self-efficacy and certain performance indicators.

patients (Lateef, 2010). Use of simulation-based learning (SBL) for training nurses in the administration of vasopressors to sepsis-simulated patients may aid in improving patient safety. The Institute of Medicine encouraged simulations as a technique in creating an environment conducive to learning by increasing training opportunities, developing critical thinking, and encouraging feedback for participants (Kohn et al., 2000). The use of SBL has been found to increase knowledge retention and confidence (Ackermann, 2009), increase recognition of similar situations in real life (Liaw, Chan, Scherpbier,

Rethans, & Pua, 2011), and potentially aid in learning new skills and enhancing performance (Barsuk et al., 2009; Crimlisk, Johnstone, & Sanchez, 2009; Ford et al., 2010; Meyer, Connors, Hou, & Gajewski, 2011; Ross, 2011).

Self-Efficacy

Self-efficacy may be one important construct in performing advanced nursing skills. Self-efficacy is defined as the “beliefs in one’s capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands” (Wood & Bandura, 1989,

p. 408). For the purpose of this project, general self-efficacy was defined as one’s overall self-efficacy trait, whereas situational self-efficacy is defined as self-efficacy limited to a specific behavior (in this case vasopressor titration in sepsis). To the knowledge of the authors, previous studies related to self-efficacy and vasopressor titration in sepsis has not been conducted. Individuals with low self-efficacy have been found to have increased apprehension and decreased emotional stability (Bandura, 1982); those with higher self-efficacy are associated with stronger work-related performance (Stajkovic & Luthans, 1998; Verplancke et al., 2008), look to gain more challenging experiences, and have been found to have increased motivation and persistence with tasks (Wood & Bandura, 1989).

Purpose and Specific Aims

The purpose of this pilot project was to determine if an SBL experience designed for patients with sepsis improved nurses’ self-efficacy and performance related to vasopressor titration skills. We specifically set out to test one-sided hypotheses for the ability of the SBL intervention to improve self-efficacy (general and situational) and skill performance.

Method

Design

This quality improvement project used a quasi-experimental pre–post test design in a simulation laboratory setting. Before implementation, approval was obtained by the university-affiliated institutional review boards. Next, the protocol was trialed by three separate participants for quality controls and procedure rehearsal. The project was then implemented as a pilot study ($n = 16$; see Figure 1). Briefly, after informed consent and orientation to the simulation laboratory, participants completed a demographic questionnaire, baseline self-efficacy tools, a

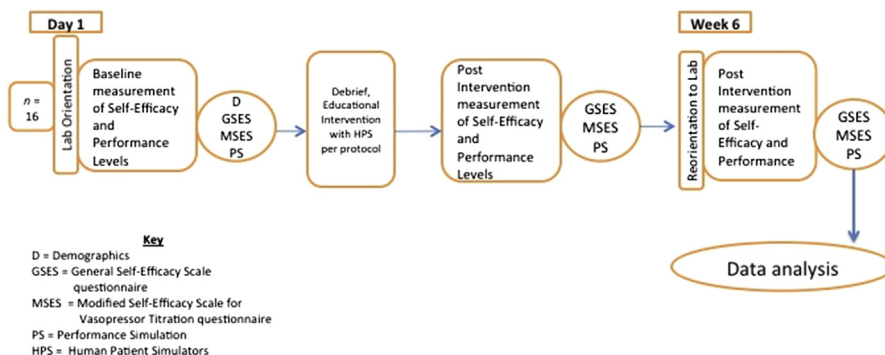


Figure 1 Outline of capstone project.

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