



History and Methods

Background

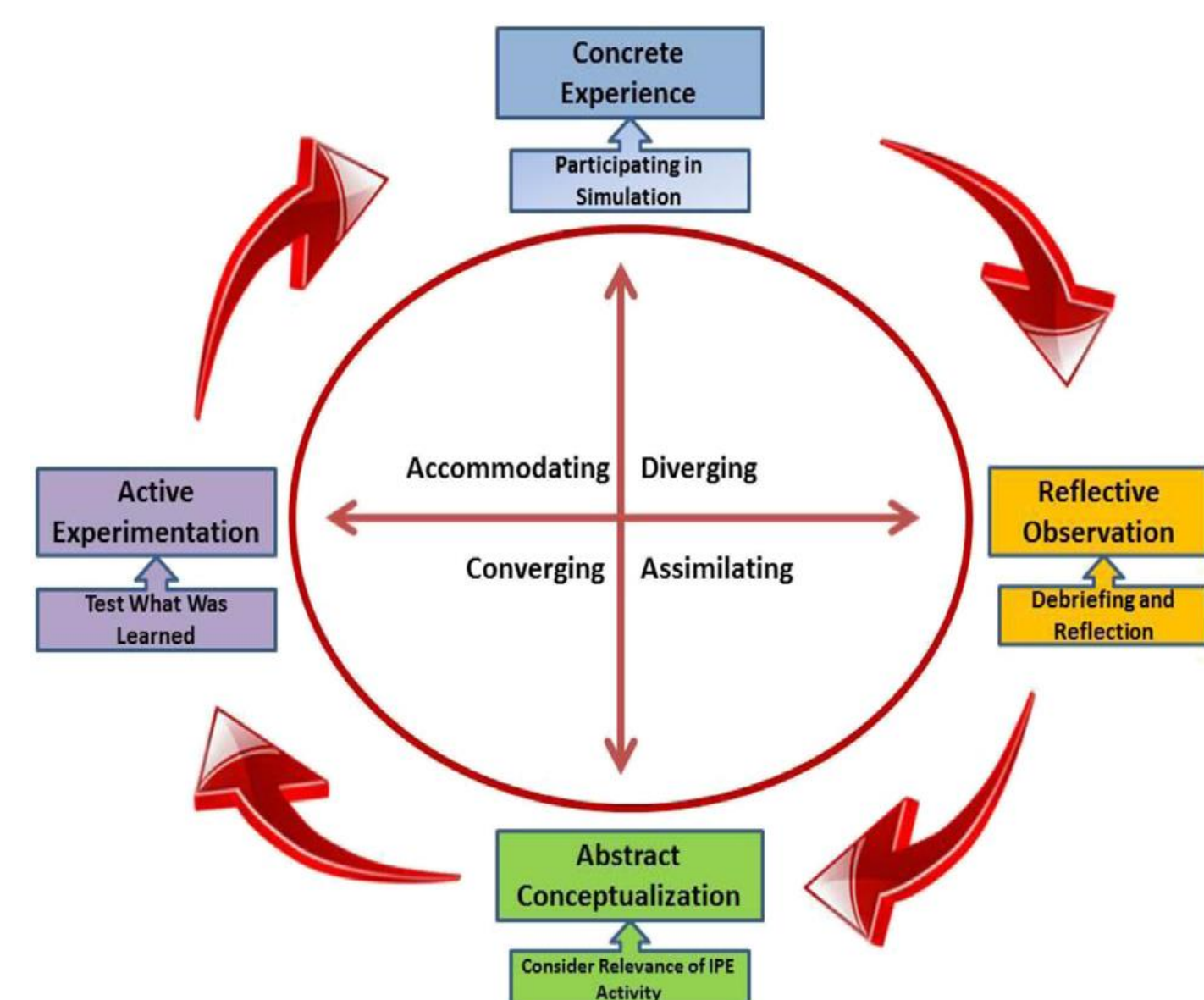
There are more than 1.5 million new cases of sepsis each year and mortality increases with each hour that the diagnosis is delayed¹. Although the Centers for Disease Control and Prevention concluded that most sepsis begins outside of the hospital², nurse practitioners may not be skilled in diagnosing or treating sepsis in the primary care setting while awaiting transport to an acute care facility^{3,4}. The aim of this study was to determine if simulation may be an answer to improving the knowledge and competence of nurse practitioners in the early identification and treatment of sepsis.

Simulation

Simulation is an experiential methodology that replicates reality and validates learning in a low-risk environment^{5,6}. Shown to increase critical thinking, skill performance, and confidence, simulation validates competence, which measures knowledge and the ability to use it appropriately^{5,7,4}. The complexity of care provided by nurse practitioners has increased with advances in science and technology requiring advanced assessment skills in order to diagnose and treat complicated conditions like sepsis⁴. However, there is a lack of documentation on the use of simulation within nurse practitioner education^{7,4}.

Methods

Twenty-four Family Nurse Practitioner and Adult Gerontology Primary Care Nurse Practitioner students were randomized into groups for participation in a clinical sepsis scenario and scripted debriefing involving a 72-year-old male with evolving sepsis presenting in a rural primary care clinic. The university's experiential learning lab was utilized for this simulation. A pretest and posttest were used to measure the knowledge and self-perceived competence⁸ of the participants. Observers completed a clinical skills checklist and field notes were collected by faculty for this mixed method design, using Kolb's Experiential Learning Theory as the framework⁹.

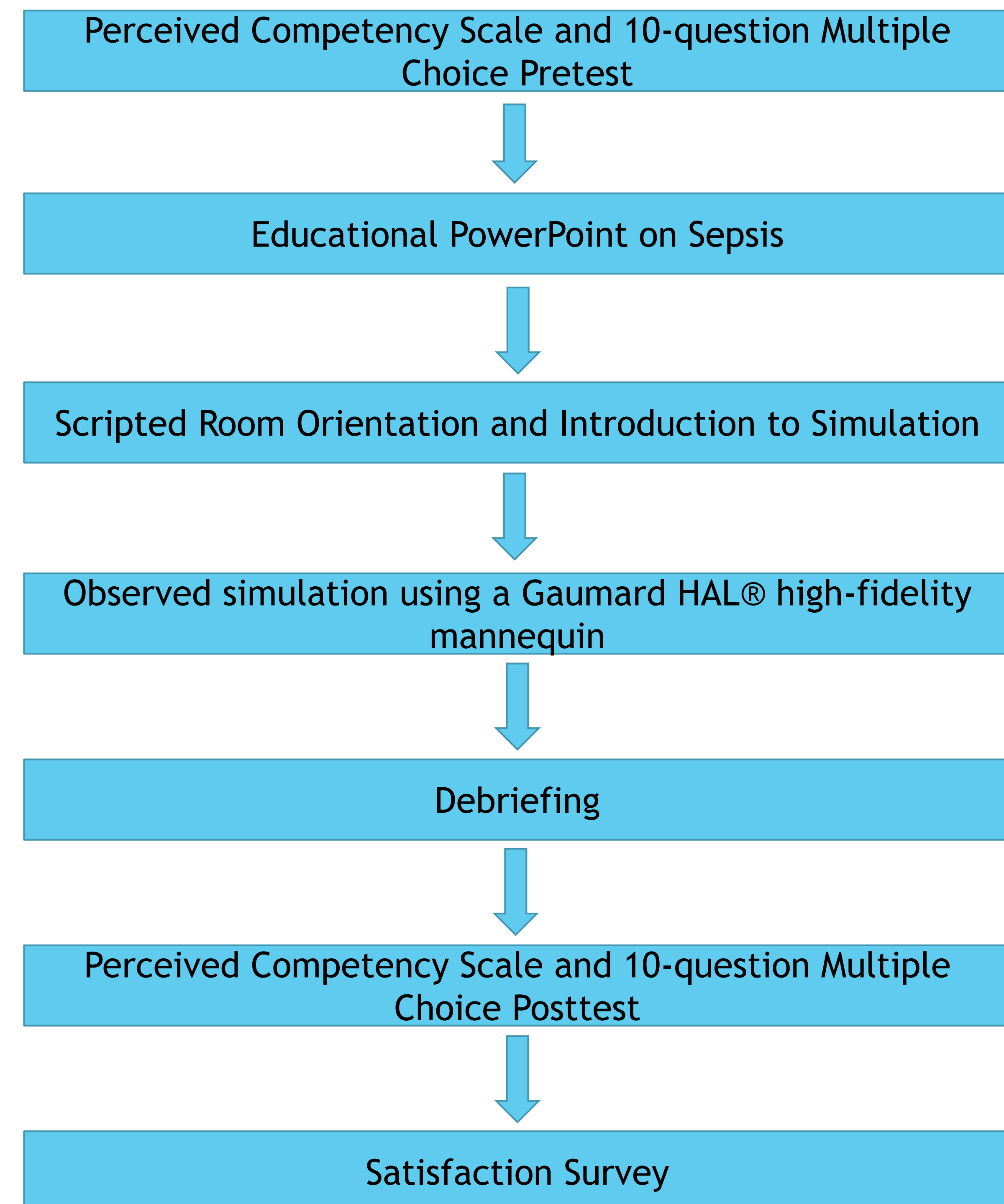


Conceptual model showing the application of Kolb's Theory in simulation. From "Simulation-Based Interprofessional Education Guided by Kolb's Experiential Learning Theory," by J. A. Poore, D. L. Sullen, and G. L. Schaar, 2014, *Clinical Simulation in Nursing*, 10, e241-247. Copyright 2014 by Clinical Simulation in Nursing. Used with permission.

Project

Definitions

The International Nursing Association for Clinical Simulation and Learning has created a simulation glossary to promote consistency across education, practice, and research. Terms utilized in this simulation were taken from the INACSL Standards resource and shared with students prior to the simulation experience¹⁰.



Results

Knowledge

Knowledge was measured using a 10-question multiple choice exam. A paired-samples t-test indicated that the mean score for the posttest (M = 9.0, SD = 0.73) was significantly greater than the mean score for the pretest (M = 6.81, SD = 0.98), $t(15) = 7.5, p < .001$. The 95% confidence interval for the mean difference between the two ratings was -2.8 to 1.5.

Competence

Competence was measured using an 8-question survey. Paired-samples t-tests were used to evaluate total competence (all eight questions), general competence (questions 1-4)⁸ and competence in sepsis (questions 5-8) before and after simulation. Significance was noted in total competence before (M = 43.75, SD = 5.22) and after (M = 51.25, SD = 3.80) simulation, $t(15) = 6.99, p < .001$. The posttest score for general competence (M = 25.82, SD = 2.23) was significantly greater than the pretest score (M = 23.65, SD = 3.09), $t(15) = 2.97, p = .010$. Additionally, sepsis competence was significant with mean score differences of 25.44 (SD = 1.93) and 20.13 (SD = 3.42), $t(15) = 6.92, p < .001$.

Qualitative Results

Overall satisfaction with the program was very high. The students felt that the training would contribute to the quality and safety of care in the clinical setting (52.63% definitely yes, 47.37% probably yes). Also 68.42% said they were very confident and 15.79% said they were extremely confident that they could apply what they learned in a clinical event. However, we found disconnect between the didactic material and the clinical skills of the students in the role of a nurse practitioner during the event. Two screening instruments introduced in the PowerPoint were not utilized in the simulation, students had difficulty owning the diagnosis of sepsis, and communication and team leadership were lacking. Students addressed the lack of protocol for sepsis presentation in primary care settings which paralyzed their actions to a degree, not understanding that some critical interventions in sepsis, such as source control, starting intravenous fluids and initiating antibiotics are achievable in many outpatient settings.

Conclusion

The current healthcare environment requires that nurse practitioners are able to apply didactic knowledge in increasingly complex clinical settings. This study interposed simulation as a means to accomplish this translation from classroom to clinic. In this project, knowledge and competence of the students, including competence specific to sepsis, was significantly increased. However, while competence was subjectively increased, it was not objectively confirmed by the students' performance. This study adds to the growing body of knowledge about the use of simulation with nurse practitioner education. It specifically contributes information about the translation of knowledge into the clinical setting in the form of competence, a key requirement in time-sensitive diseases like sepsis.



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