Simulation: Transformative Learning

Brian Parker

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Definition

Simulation often involves nursing education programs using human-like manikins, or human patient simulators (HPS), which can range from low fidelity to high fidelity, as tools to facilitate exploratory learning. *High-fidelity* refers to the most technologically advanced versions, which are able to mimic many human physiological reactions to trauma, illness, and interventions. The manikin is designed to look human and to respond in a human like manner, responses which are controlled by an instructor or facilitator via a computer, which in turn allows him or her to direct scenarios that mimic illness and trauma via interactive physiological systems such as cardiovascular, respiratory, and neurological. Nursing students are able to apply nursing interventions such as medication administration (among many others) after assessing alterations in health in the HPS. The facilitator can then replicate physiological changes in health status and acuity in response to the student's interventions as required for the clinical scenario. Often the HPS is placed in a room designed to mimic a clinical environment (e.g., hospital room) to realistically simulate a nursing care experience.

Application

Depending on the desired learning outcomes, nurse educators must be aware of the pedagogical structures that underpin simulation-based clinical curriculum. To this end, dominant learning theories in modern nursing education such as behaviorism and constructivism must be considered when facilitating high-fidelity simulated learning sessions. Depending on whether the goal is the rote learning of factual knowledge and psychomotor skills or, conversely, the enhancement of problem solving (clinical judgment) and/or group process, nurse educators should consider the application of behaviorist or constructivist pedagogy in designing HPS-based

clinical scenarios. Guidelines for behaviorist-based simulation include the incorporation of low levels of acuity and complexity to avoid overwhelming the cognitive schema of adult learners, the repetition of learning experiences, theory supplementation, and the incorporation of modular learning as a framework for simulation-based curricula. Conversely, guidelines for constructivist-based simulation include access to a variety of information resources in the simulation laboratory, the negotiation of learning objectives between the instructor and the students, and the creation of messy or poorly structured scenarios that involve uncertainty, increased acuity, and amplified environmental noise. Educators may also want to consider a blend of philosophical constructs in developing HPS-based clinical scenarios for use in undergraduate nursing education. To guide decision making form of pedagogy to apply it is pertinent to also consider the role of social discourse and transformative learning theory plays in a simulation-based learning environment.

HPS-based clinical scenarios are in reality social endeavors that lead to the collaborative creation of knowledge (Parker & Myrick, 2012). Therefore the roles of social discourse and perspective transformation in Mezirow's (1994, 1995) transformative learning theory should come to the forefront. HPS-based clinical scenarios, with their use of group process, peer filtering of knowledge, and critical reflection, are well suited to aiding in the transformation of meaning schemes and perspectives that is necessary for new practitioners to thrive in the modern healthcare environment. HPS-based clinical scenarios are also useful in delivering disorientating dilemmas that upset learners' meaning schemes and understanding of healthcare context and skills application. Upsetting their perceived knowledge, values, and beliefs about clinical practice through exposure to high-fidelity simulation helps students learn to re-interpret the dilemma and ultimately incorporate the new meanings into their cognitive schema. Similar to

constructivist pedagogy, transformative learning theory promotes educational practices to empower learners. These practices help students to define own their own goals, make choices during the learning experience, and problem-solve; help the instructor to model through the experiential engagement of learners; and encourage regular, non-competitive feedback (Mezirow, 1991).

Other strategies specific to HPS utilization that that may be considered include repeating HPS scenario sessions, increasing students' exposure to foster the development of trusting relationships in the learning environment, debriefing immediately, using video playback to promote critical reflexivity, and encouraging peer evaluation in the debriefing process. Nurse educators should also consider using gradual or incremental disorientating dilemmas for more junior learners instead of exposing them to highly traumatic, emotionally charged experiences to avoid overwhelming or even traumatizing them and hindering their ability to cognitively process the scenario and the clinical skills/inherent within. This raises the concept of potential threats by exposing students with limited experience and underdeveloped (or, for some, unrefined) knowledge to the social learning process that is characteristic of many HPS-based simulated clinical learning experiences. For many students, especially more novice learners (e.g., first- and second-year nursing students), there appears to be a significant potential for their self-esteem and confidence in their clinical knowledge and skills to be threatened in a high-fidelity simulated clinical session. Further recommendations to counter these potential threats include gradually increasing peer observation of those performing in a simulated clinical environment in relation to the students' experience and confidence levels. Assessing the overuse of signal and noise (environment stimuli), increasing or decreasing the simulation facilitator's direct interjection of support during a clinical scenario, leveling acuity and interpersonal conflict to the level of the

student, maintaining role authenticity (the voice of the 'patient' through the manikin), and providing students with the tools necessary to become orientated to both the simulation environment and the upcoming HPS-based clinical scenario.

Synopsis

The current body of research has shown evidence of both students' and educators' perceived efficacy of simulation (Mould, White, & Gallagher, 2011; Smith-Stoner & Hand, 2008), perceived confidence building (Fisher & King, 2013) and moderate evidence of improved skill performance and/or retention (Cant & Cooper, 2009; Levett-Jones, Lapkin, Hoffman, Arthur, & Roche, 2011) to validate the practice of high-fidelity-based simulated scenarios in nursing education. Unfortunately, the current state of knowledge has specific limitations, including an overemphasis on the simple description of a phenomenon (Rourke, Schmidt, & Garga, 2010); at the same time, however, external validity is lacking as a result of informal evaluation methods and problems with rigor (Harder, 2010). Although the external validity of studies done to date may be questionable, the current body of research serves to broadly endorse simulation as a valid educational practice.

More specific endorsement of HPS-based nursing education can be seen in relation to the application of transformative learning theory. In particular HPS serves to enhance social dialogue and subsequently peer-validated socially derived knowledge amongst nursing students (Leigh & Hurst, 2008; Parker & Myrick, 2010) Although HPS-based clinical scenarios have the potential to transform nursing students' meaning schemes with regard to clinical practice and knowledge, there is also the potential to overwhelm the cognitive capacity and cause feelings of anxiety, stress, fear, and disengagement (Parker & Myrick, 2012). To this end, Dunnington

(2014) also recommends avoiding simple instrumental utilization of high-fidelity HPS to consider context and how the learner engages a clinical scenario.

Recommendations

The proliferation of human patient simulators (HPSs) in undergraduate nursing education raises questions about the application of well-informed pedagogical practices. Despite a growing body of research into this technology-based learning tool, there is insufficient evidence on which to base decisions on best practice to both structure simulation-based curriculum and facilitate HPS-based clinical scenarios that meet the learning needs of the modern adult learner (Cant & Cooper, 2009; Rourke, Schmidt, & Garga, 2010). Although HPS-based clinical scenarios facilitate group process and social construction of knowledge (Leigh & Hurst, 2008; Parker & Myrick, 2010), there has been only limited research into these social processes to date. Inquiry into HPS-based learning is required to be able to conceptualize the social processes that occur within and thereby develop theoretical foundations not only to inform the implementation of simulated clinical scenarios, but also to guide future studies. Fischer and King (2013) also noted that further research is needed in the areas of simulation and interprofessional collaboration as it relates to healthcare education.

Ultimately, there is a need to move beyond the hypothetico-deductive approach and build a theoretical framework based on the processes that occur in high-fidelity simulation. This movement will also serve to foster future research, whether deductive or inductive, that most accurately reflects the complex social processes that those who participate in HPS-based clinical scenarios experience. Uncovering the social processes that occur with the HPS-based simulated clinical learning environment will assist nursing educators in developing simulation-based curricula that is truly 'transformative learning' for the modern adult learner.

References

Cant, R. P., & Cooper, S. J. (2009). Simulation-based learning in nurse education: Systematic review. *Journal of Advanced Nursing, 66*(1), 3-15.

Dunnington, R. M. (2014). The nature of reality represented in high fidelity human patient simulation: Philosophical perspectives and implication for nursing education. *Nursing Philosophy, 15* (1), 14-22.

Fischer, D., & King, L. (2013). An integrative literature review on preparing nursing students through simulation to recognize and respond to the deteriorating patient. *Journal of Advanced Nursing, 69*(11), 2375-2388.

Harder, B. N. (2010). Use of simulation in teaching and learning in health sciences: A systematic review. *Journal of Nursing Education, 49*(1), 23-28.

Leigh, G., & Hurst, H. (2008). We have a high-fidelity simulator, now what? Making the most of simulators. *International Journal of Nursing Education Scholarship, 5*(1), 1-9.

Levett-Jones, T., Lapkin, S., Hoffman, K., Arthur, C., & Roche, J. (2011). Examining the impact of high and medium fidelity simulation experiences on nursing students' knowledge acquisition. *Nurse Education in Practice, 11*, 380-383

Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco: Jossey-Bass.

Mezirow, J. (1994). Understanding transformative theory. *Adult Education Quarterly, 44*(4), 222-232.

Mezirow, J. (1995). Transformation theory of adult learning. In M. R. Welton (Ed.), *In defense of the lifeworld* (pp. 39-70). New York: SUNY Press.

Mould, J., White, H., & Gallagher, R. (2011). Evaluation of a critical care simulation series for undergraduate nursing students. *Contemporary Nurse, 38*, 180-190.

Parker, B. C., & Myrick, F. (2010). Transformative learning as a context for human patient simulation. *Journal of Nursing Education, 49*(6), 326-332.

Parker, B. C, & Myrick, F. (2012). The pedagogical ebb and flow of human patient simulation: Empowering through a process of fading support. *Journal of Nursing Education, 51*(7), 365-372.

Rourke, L., Schmidt, M., & Garga, N. (2010). Theory-based research of high fidelity simulation use in nursing education: A review of the literature. *International Journal of Nursing Education Scholarship, 7*(1), 1-14.

Smith-Stoner, M., & Hand, M. W. (2008). A criminal trial simulation: Pathway to transformative learning. *Nurse Educator, 33*(3), 118-121.