The Significance of High-Fidelity Simulation in Nursing Education

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Abstract

High-fidelity nursing simulation is an innovative technology that has changed the delivery of post-secondary nursing education. Overwhelming research supports the use of high-fidelity simulation in nursing to demonstrate enhanced critical thinking, caring behaviours, and collaboration. Furthermore, high-fidelity simulation provides the learner with the opportunity to practise professional behaviours that are ethical, legal, and evidence-based. Therefore, high-fidelity nursing simulation is an educational initiative that supports the future best practice of health-care professionals.

High-fidelity simulation (HFS), although initially introduced in the 1930s for aviation education, has demonstrated significant efficacy in nursing education over the past decade (Bryce et al., 2009). In HFS, technology, namely realistic mannequins and computer software, create a simulated clinical experience that requires student interventions such as medication administration, oxygen therapy, and intravenous infusions. HFS has shifted educational, behavioural, and inter-professional learning strategies in nursing education. Simulation in nursing education has used innovative technology that supports critical analysis, confidence building, and collaborative practice (Jeffries, Hovanscsek, & Clochesy, 2006). Currently, more than 80% of nursing schools use HFS equipment that blends technology with nursing curricula (Knudson, 2013, p. 5). HFS provides a safe learning environment that presents an opportunity to apply theory to practice, master skills, and experience collaboration, leading to positive patient outcomes, therapeutic interventions, and effective teamwork (Kaddoura, 2010). In addition, simulation enhances caring behaviours that underpin professional nursing practice, such as attentive listening, positive connectedness, and respectful behaviours (Blum, Hickman, Parcells, & Locsin, 2010). Nursing, as a profession, embraces the use of technology that supports professional practice, client-centred practice, professional relationships, and ethical practice (College of Registered Nurses of Manitoba, 2013). Accordingly, preparing nurses for professional practice requires an investment in HFS that signifies educational, behavioural, and inter-professional strategies to reach excellence in academia, care, and collaboration.

Educational Strategies

Education in nursing endeavours to apply knowledge to practice. As such, simulation is recognized as an educational technology in nursing that supports critical thinking, decision-making, and skill mastery (Brydges, Carnahan, Rose, & Dubrowski, 2010). Jeffries et al. (2006) found that students using HFS as a blended method of learning scored significantly higher than their non-simulation counterparts. The rationale for the findings was that simulation complements learning styles, critical analysis, and behavioural components. Therefore, simulation is a modern technology that supplements curricula, and provides faculty with an innovative method to impart knowledge, skill, and expertise in practice.

Critical thinking has been deemed a vital nursing characteristic that relates to ethical, evidence-based, and knowledgeable practice (Kaddoura, 2010). Simulation provides an educational opportunity to facilitate higher level analysis of disease process, interventions, and potential outcomes. HFS elicits critical thinking because the mannequin replicates anatomy, disease symptoms, and responses based on nursing interventions (Cant & Cooper, 2010). For instance, the mannequin may report difficulty breathing and present with symptoms associated

with pulmonary embolism or pulmonary edema, therefore requiring the nurse to analyse the data critically. HFS also demonstrates positive outcomes for both participant and observer, suggesting that critical analysis occurs despite active participation (Kaplan, Abraham, & Gary, 2012). Consequently, using HFS in nursing education provides profound feedback, both observed and participative, that influences critical thinking and results in effective decision-making strategies.

Effective decision-making in nursing is a process that becomes more proficient and expert over time. Skilled nurses make decisions based on years of experience, training, and mentorship (Purling & King, 2012). Unlike their expert colleagues, novice nurses enter the profession lacking the necessary exposure to clinical situations and decision-making, presenting a major patient safety concern. In this case, educational programs that use simulation for decision-making scenarios build from simple to complex, in order to develop proficiencies and strategies that save lives. The benefit of simulation in educational programs is the ability to practise in a safe environment without compromising patient safety. Thus, gaining valuable feedback during simulation influences best practice and decision making (Cook et al., 2013).

Skill mastery may be identified as a main benefit of HFS. Experiential learning using simulation provides students with an opportunity to practise from a kinaesthetic perspective, using simulation as a way to develop hands-on experience (Bultas, Hassler, Ercole, & Rea, 2014). Determining competence, or skill mastery, is largely identified by the amount of purposeful practice (Jeffries et al., 2006). For instance, using simulation to develop skill mastery provides an opportunity to practise nursing skills, with immediate feedback from faculty, mannequins, and related simulation equipment (Cant & Cooper, 2010). This type of immediate feedback is essential in developing skill mastery because simulation technology has the ability to measure risk, harm, and potential outcomes. In this way, correct practice leads to skill mastery (Sherwin, 2012). Lastly, in a simulation scenario, the student nurse moves from a position of passive learner to active participant, while demonstrating skill mastery in a safe environment (Brydges et al., 2010).

Behavioural Strategies

Although HFS has commonly been used to enhance educational goals related to critical thinking, decision-making, and skill mastery, nursing simulation also offers an overwhelming opportunity to teach behavioural objectives such as caring, confidence, and effective nurse-patient relationships. Caring is the fundamental underpinning of the professional nurse, yet mounting nurse shortages, cost-containment, and patient acuity render the philosophy of caring vulnerable to being forgotten (Blum et al., 2010). For this reason, nursing simulation is a paramount initiative that can facilitate nursing behaviours required for future practice.

Caring behaviours represent the human element in nursing. Touch, listening, and advocacy are caring behaviours that are valued in educational programs, but are typically facilitated in clinical experiences generated between the nurse and the nursed (Blum et al., 2010). Nevertheless, HFS has shown statistically significant results in teaching caring behaviours to students (Blum et al., 2010). For instance, educators can create simulation scenarios that require students to respond to clients by using caring behaviours that demonstrate empathy, compassion, and collaboration. As a result, students have an opportunity to practise psychomotor skills and nursing knowledge in a safe environment that supports self-reflection, confidence in caring practices, and expressions of the art of nursing. Among the top caring behaviours identified through HFS, touch, attentive listening, and positive connectedness are paramount. Although nursing reflects science, the art of caring is a behavioural educational initiative that produces a humanistic response, created through technology.

Next, confidence in professional practice has also been greatly enhanced by HFS. In the past, new nursing graduates were reported to lack confidence in practice, which resulted in delayed patient care (Purling & King, 2012). In addition, anxiety and fear of reprimand presented

barriers for competent nursing practice in the novice nurse. Research has suggested that anxiety in clinical situations also reduces the synthesis of learning, as students disengaged due to fear of incompetence (Sinclair & Ferguson, 2009). Currently, HFS is used to improve confidence and self-efficacy in nursing students by engaging students in clinical scenarios that elicit confidence and critical analysis, in an attempt to overcome noted barriers (Mould, White, & Gallagher, 2011). Students value HFS experiences and appreciate the opportunity to practise critical scenarios in a safe environment. Therefore, guiding students to reach their potential includes building confidence in using HFS in academic programming.

Nurse-patient relationships may be affected by emotionally charged situations. In this case, HFS offers students an opportunity to experience a range of potential nurse-patient situations that include end-of- life care. High-stress clinical situations, including end-of-life care elicit emotional responses that may be overlooked in traditional teaching modalities (Leavy, Vanderhoff, & Ravert, 2011). As such, in simulation exercises the students experience emotionally distressing situations in a safe environment, enabling them to cope with fears, gain feedback, and process the situation (Leavy et al., 2011). Thus, HFS has shown great benefit for students to reflect on their own emotional tendencies in high-stress situations that may affect nurse-patient relationships (Moreland, Lemieux, & Myers, 2012).

Inter-Professional Collaboration

Inter-professional collaboration in nursing demonstrates client-centred care while considering the expertise of other disciplines. Simulation provides a teaching environment that facilitates inter-professional collaboration by viewing the perspectives of alternate disciplines that result in positive patient outcomes, enhanced communication, and health professional education (Reese, Jeffries, & Engum, 2010). In addition, simulation recognizes the unique attributes of each discipline that may reduce professional biases and beliefs through role-playing (Fagan, Lackie, Banfield, & Pendergast, 2010). Fagan et al. (2010) suggested that learning occurs together, thus improving understanding and complementing the professional abilities that each team member brings to client-centred care. As such, HFS facilitates inter-professional collaboration through scenario-based simulation that provides nursing with an alternate perspective, encouraging respect for other professional's knowledge, expertise, and skill base, resulting in enhanced collaborative practice.

Next, simulation facilitates inter-professional collaboration by creating a safe environment to practise communication strategies. Students have reported that simulation creates a learning environment that enhances leadership and communication skills with other disciplines (Kaddoura, 2010). Additionally, cross-training with other disciplines assists in the development of effective team work and collaboration. Alternately, simulation can be used to test inter-professional collaboration and teamwork to evaluate the methods that teams use to foster patient-centred care (Sherwin, 2012). Accordingly, HFS in nursing education encourages communication, shared decision-making, and a respectful workplace (Purling & King, 2012).

Lastly, simulation has the potential to influence industry beyond education to create partnerships that encourage community programs and services. For instance, HFS in post-secondary education can be used by hospitals, fire and rescue personnel, and community service workers. Simulation creates real-world scenarios that are applicable to health providers at large, which improves patient safety, quality of care, and efficiency in service (Howard, 2014). As such, the investment in HFS may be supported by community organizations and professional stakeholders to support continuing education in health-related fields.

Conclusion

HFS in nursing education promotes best practice. Simulation in nursing programs goes beyond current curricula in order to build the potential of future nurses, and empower the use of

technology to support critical thinking, decision-making, and skill mastery. Further, HFS supports the development of caring behaviours that influence self-efficacy, nurse-patient relationships, and competence. The art of nursing is clearly developed through simulation while recognizing that nursing blends science with humanistic perspectives. Lastly, simulation builds teams that promote client-centred care, resulting in a more efficient, collaborative, and respectful health-care environment. Therefore, HFS surpasses current teaching and learning methods, by incorporating technology to reach best practice.

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