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Featured Article

# Virtual Clinical Simulations in an Online Advanced Health Appraisal Course

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**KEYWORDS**
virtual patient;
simulation;
digital standardized patient;
virtual clinical simulation;
skill acquisition;
situated cognition;
health assessment

**Abstract**

**Background:** Acquisition of knowledge and skills by nurse practitioner students before real-life practice is a familiar nursing education challenge.

**Methods:** Virtual clinical simulations (VCSs) using Digital Clinical Experience™ were introduced in an advanced health appraisal course to explore how these VCSs affected students' learning and perception of their simulation experience as a learning strategy in an online course using a quasi-experimental design. Differences for intervention (VCS) and control groups (no VCS) were measured.

**Results:** No significant difference was revealed in course grades, integrated performance proficiency scores, or in National League of Nursing simulation scores.

**Conclusion:** The integration of VCSs into current standardized online course content as an adjunctive learning experience warrants additional evaluation.

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Nurse practitioner (NP) educators are challenged with identifying and implementing teaching strategies that facilitate the development of clinical reasoning and decision-making skills. Newhouse et al. (2011) reported that family NPs (FNPs) provide safe, effective, high-quality care with positive clinical outcomes. As NPs have assumed expanded roles for management of patient care, the emphasis on the quality and safety of that care has never been higher. A factor that prompted this exploratory study included the increasing numbers of NP students competing for decreasing numbers of clinical placement sites. This is a phenomenon that has been identified for some time with limited feasible alternatives identified (Credan & Lok, 2011; Amella, Brown, Resnick, & McArthur, 2001). NP educators rely on quality clinical placement sites and preceptors to assist in the education of students (Ivey, 2006). Despite evidence that NP preceptors readily acknowledge the importance of precepting students, the reality of precepting is rife with barriers that include high productivity expectations for NPs (impacting the time preceptors have to teach and mentor), limited clinical space, and rigid electronic medical record requirements that limit student use (Brooks & Niederhauser, 2010). This means that NP

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educators are tasked with finding alternative methods for facilitating the development of crucial assessment, clinical reasoning and decision-making skills and providing opportunities to practice and hone these skills in preparation for placement with a clinical preceptor. Assessment of skills and clinical reasoning is even more difficult in online NP education courses as instructors do not meet with students in person regularly and therefore have fewer opportunities to model behaviors and evaluate student performance. There was a desire to explore how clinical proficiency could be enhanced by the use of virtual clinical simulations (VCS) with a virtual patient. The overall aim of this study was to explore how clinical proficiency in health assessment skills of online FNP students who participated in a VCS with a virtual patient compared with that of students who participated in standard course activities and explore students' perception of their simulation experience as a learning strategy.

**Key Points**

- Integration of virtual clinical simulations in a graduate online learning environment is a feasible, cost-effective strategy for providing an additional means for skill acquisition and evaluation.
- There was no significant difference in the course grades and IPP scores between between the intervention and control groups following the addition of virtual clinical simulations into an Advanced Health Appraisal course.
- The use of virtual clinical simulations as a learning and skills assessment strategy needs to be further evaluated in family nurse practitioner students.

## Background

Simulation allows development of a clinical scenario, which is intended to resemble practice (Jeffries, 2005). Digital or Web-based simulation tools have been introduced in nursing education in recent years (Koch, Andrew, Salamonson, Everett, & Davidson, 2010). Simulation experiences that integrate feedback and debriefing or guided reflection have shown the ability to facilitate the link between theory and practice and increase learners' ability to synthesize a body of knowledge (Bruce, Bridges, & Holcomb, 2003). Virtual patient simulations have been found to be an engaging and cost-effective tool for providing students with clinical simulation experiences (Cosorti, Mancuso, Nocioni, & Piccolo, 2012; Cook & Triola, 2009; Cook, Erwin, & Triola, 2010). Virtual patients permit a standardized clinical simulation environment, which provides students with a consistent experience to practice and assess skills. Virtual patients are particularly well suited for learning in online education formats, as they can be accessed asynchronously at the convenience of the student. Virtual patients are relatively new to the field of nursing simulation, but the low cost and ease of access in comparison to simulation utilizing high-fidelity simulators or standardized patients (SPs) lend them high appeal in nursing education where budgets are typically limited and qualified nurse educators are in short supply (Cook & Triola, 2009).

The existing studies conducted on virtual patients in health professions education include quantitative, qualitative, quasi-experimental, and comparative designs and have all found no significant differences between learning outcomes and learner satisfaction when compared with other types of clinical simulation (Consorti, Mancuso, Nocioni, & Piccolo, 2012; Cook et al., 2010). Virtual patient simulation has been extensively used in medical education (Credan & Lok, 2011; Gunning & Fors, 2012; Botezatu, Hult, Tessma, & Fors, 2010a,b) and undergraduate nursing education (Friedman & Goldschmidt, 2014; Forsberg, Georg, Ziegert, & Fors, 2011; Foronda, Gattamorta, Snowden, & Bauman, 2013) with few studies using graduate nursing education (Kleinheksel, 2014). In addition, virtual patients have been found to be acceptable to students as an educational opportunity specifically for health assessment skills (Forsberg et al., 2011). One study suggested that virtual clinical simulations can provide transformative learning experiences for advanced practice nursing students when self-reflective activities are included (Kleinheksel, 2014). Botezatu et al. (2010a,b) found that virtual patient simulations improved long-term retention of learning when compared with traditional teaching strategies. The use of virtual clinical simulation technology is a teaching strategy that promotes skill acquisition and provides a viable method for assessment of clinical skill and clinical reasoning within medical and undergraduate nursing education. Few studies have explored virtual clinical simulations with NPs.

## Theoretical Framework

Situated cognition (also known as situated learning) is a learning theory drawn from the work of cognitive scientists and is based on the assertion that learning is influenced by the situation in which it occurs. Collins (1988) defined situated learning as learning knowledge and skills in context before the learner using the knowledge in real life. Lave and Wenger (1991), considered experts in situated cognition, wrote that becoming proficient has as much to do with joining a culture of practitioners as it does with becoming technically skilled. The authors emphasized that learning in a practice setting includes acculturation (joining a community of practice) as