

## Nursing Education Research Conference 2018 (NERC18)

### Using Virtual Patient Simulation in Substitution of Traditional Clinical Hours in Undergraduate Nursing

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#### Introduction

In recent years, undergraduate nursing education has been facing numerous challenges as the demand for nurses continues to increase. The shortage of nursing faculty in addition to increased student enrollment has put a greater burden on the limited resources available in most programs (Cobbett & Snelgrove-Clarke, 2016; Foronda, Godsall, & Trybulski, 2013; Foronda & Bauman, 2014; Laure, Pepin, & Allard, 2015). There is also a shortage of the clinical placements necessary to provide students with the education and experience necessary to become a competent and autonomous professional nurse (Cobbett & Snelgrove-Clarke, 2016; Foronda et al., 2013, 2014; Khalaila, 2014, Laure et al., 2015). Given these persistent challenges, many nursing programs have started to substitute students' traditional hours with some form of simulation. The National Council for State Boards of Nursing Simulation Study provided evidence that substituting high-quality simulation experiences for traditional clinical hours results in comparable educational outcomes in undergraduate nursing clinical courses (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014).

In nursing education, simulation is usually defined as the most accurate possible representation of a care situation and can be categorized relative to its degree of clinical fidelity: high, intermediate, or low (Laure et al., 2015). Virtual patient simulations are considered to be high-fidelity simulations because they are "extremely realistic and provide a high level of interactivity and realism for the learner" (Meakim, Boese, & Decker, 2013, p.6). Virtual patient simulations have been found to be comparable or superior to other high-fidelity traditional simulation methods due to a variety of reasons. In an integrative review of 12 studies published between 2008 and 2015, Duff, Miller, and Bruce (2016) found that virtual patients and simulated scenarios were comparable or superior to traditional simulation methods for teaching diagnostic reasoning and assessment skills in terms of increased student learning, satisfaction, and engagement.

The purpose of this study was to investigate how pre- (BSN) and post-licensure (RN-BSN) nursing faculty are using virtual patient simulations to replace traditional clinical hours, and to describe the role that various integration use cases may play in improving the preparation of students as more nursing schools decide to adopt this technology into their curriculum.

#### Methods

**Participants.** Of the entire population of faculty using the Health Assessment Digital Clinical Experience™ (DCE) during the 2017 spring and summer semesters, 185 faculty responded to an online evaluation survey administered at the end of their health assessment course. The final sample for the quantitative portion of the study were 78 undergraduate faculty (47 BSN and 31 RN-BSN) in 56 nursing schools across the United States who indicated use of the DCE in lieu of traditional clinical hours on the survey. In addition, follow-up semi-structured interviews were conducted with 10 faculty from that group (5 BSN and 5 RN-BSN).

**Materials.** The DCE is an online, asynchronous virtual patient clinical simulation that provides an immersive experience designed to improve students' assessment skills and clinical reasoning through the examination of virtual patients. Across different assignments, students can practice taking a detailed health history, perform physical assessments in single-system exams, and conduct focused exams to rule out causes of a virtual patient's chief complaint. After each assignment, students complete post-exam activities where they can apply content knowledge as well as self-reflect on their performance. When

students submit their assignment to their instructor, they receive a score and immediate feedback on several aspects of their performance, including subjective data collection, objective data collection, and on their ability to identify opportunities to engage in therapeutic communication. These performance assessment instruments have been previously validated for nursing accuracy and learning value by several subject-matter experts.

**Measures.** The researchers developed a 32-item survey to assess how undergraduate faculty used the DCE in lieu of traditional clinical hours in their health assessment courses. Specifically, the survey explored different topics ranging from how they used each of the assignments in class (e.g., as part of the lecture led by instructor or as classroom group activity led by students) to how they used it to assess student performance (i.e., open practice, formative pass/fail or lab pass, summative with letter grade, or test). The survey included two closed-ended questions directed to the use of the DCE as a replacement of traditional clinical hours: "Did the time students spent in the DCE replaced any portion of their required traditional clinical hours?" (response categories: Yes/No), and "What portion of your courses required clinical hours were met by the DCE?" (response categories: 10% or less, between 11% and 25%, between 26% and 50%, more than 50%). The survey also included demographics and teaching background questions (i.e., gender, race/ethnicity, years of teaching experience, length of DCE use, course modality, and number of students taught). Semi-structured interviews included open-ended questions about how faculty were using the DCE to replace traditional clinical hours in their courses: "How does your institution fulfill the remainder of the clinical hours requirement?", "What drove you to the decision to use the DCE (or simulation in general) to satisfy clinical hours requirements?", and "What reasons would an institution have to not use the DCE (or simulation in general) to fulfill clinical hours requirements?".

**Procedure.** Each participating faculty received a link to the online survey instruments shortly after their course ended. The researchers directly reached out to those interested in participating in the semi-structured interviews.

**Analysis.** The data included in this study employed both quantitative and qualitative elements in a mixed-model design (Johnson & Onwuegbuzie, 2004). We used descriptive statistics and chi-square analysis to compare BSN and RN-BSN faculty responses on the survey. Responses to the open-ended interview questions were first coded for distinct concepts and themes in each faculty group separately. Then, responses were counted within each of the identified themes to obtain frequencies of occurrence.

## Results

**Quantitative results.** The majority of the participating BSN faculty taught health assessment face-to-face (88%), while the majority of the RN-BSN faculty taught health assessment online (69%). Compared to BSN faculty, RN-BSN faculty who teach online are significantly more likely to spend more hours of traditional clinical time with the DCE. RN-BSN faculty are also more likely to use the DCE in a more formative manner, while BSN faculty in a more summative manner.

**Qualitative results.** The main themes emerging among responses from BSN faculty were: 1) DCE helps maximize resources in light of shortage of sites and personnel, 2) DCE provides a safe practice environment for students to practice, and 3) DCE provides meaningful learning outcomes compared to traditional clinical hours. The main themes emerging among responses from RN-BSN faculty were: 1) DCE replaces minimum interaction hours with a preceptor, 2) DCE provides meaningful learning outcomes compared to traditional clinical hours, and 3) DCE allows students to practice skills and run emergency scenarios.

## Conclusion and implications for nurse educators

In light of persistent shortages of clinical placements and faculty, undergraduate nursing programs are in an increasing need of a variety of simulation modalities to achieve their learning objectives assessment outcomes. Virtual patient simulations present a flexible and standardized option for faculty when it comes

to replace traditional clinical hours. This study found that faculty teaching both learning populations find that virtual patient simulations provide meaningful learning outcomes compared to traditional clinical hours. This study also found that BSN and RN-BSN faculty may have different needs for replacing traditional clinical hours with virtual patient simulations (safe practice environment vs. replacing minimum interaction with preceptors), and that RN-BSN faculty teaching online health assessment courses are more likely to use virtual patient simulation in lieu of clinical hours in a formative manner. The findings of this study can be used to add additional evidence to case for using virtual patients in nursing education, but more importantly, it can be used to help faculty better frame the design, use, and value of virtual patients for their different student populations.

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**Title:**

Using Virtual Patient Simulation in Substitution of Traditional Clinical Hours in Undergraduate Nursing

**Keywords:**

Clinical hours, Undergraduate nursing and Virtual patient simulation

**References:**

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**Abstract Summary:**

The NCSBN simulation study of 2014 provided evidence that substituting high-quality simulation experiences for traditional clinical hours results in comparable educational outcomes. The authors present the results of a mixed-methods study and discuss the role that virtual patient simulations play in improving the preparation of pre- and post-licensure baccalaureate students.

**Content Outline:**

1. Introduction
2. Methods

- a) Participants
  - b) Materials
  - c) Measures
  - d) Procedure
  - e) Analysis
3. Results
- a) Quantitative analysis
  - b) Qualitative analysis
4. Conclusion and implications for nurse educators

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**Author Summary:** Francisco Jimenez earned his BS degree in psychology from the University of Chile. He received his master's and PhD degrees in research, assessment and evaluation methodology in education from the University of Florida. He currently works as a Psychometrician and User Experience Researcher at Shadow Health, in Gainesville, Florida.

**Any relevant financial relationships?** Yes

Relationship	Description of Potential Conflict
Salary	I am a current employee of an educational software company that develops virtual patient simulations for health professions.