



Three-Dimensional Computerized Simulation: Evaluation of an Innovative Pedagogy to Prepare Graduate Nursing Students for Advanced Clinical Practice

Carole E. Jenson, DNP, APN, CNS, ACNS-BC, CME, CCRN-K, Associate Professor

Winona State University-Rochester, 859 30th Ave SE, Rochester, Minnesota 55904



INTRODUCTION

Clinical skills and patient assessment determine trajectory of patient's health care. Literature reveals that many graduate nursing students are entering into clinical situations unprepared in patient assessment, diagnostic reasoning, clinical decision making, and team participation. Traditionally, these skills were practiced with direct patient care experiences during clinical time or job experiences. Decreased availability of clinical sites, fewer clinical mentors, and increasing patient acuity encourages the need for innovative pedagogy. Computerized simulation is one pedagogy for students to practice skills before entering into the clinical arena. Computerized learning methods are interactive, stimulating for the learner, and cost effective. Purpose of this study was to examine the use of computerized simulation for advanced practice graduate nursing students. Three-dimensional computerized simulation program (TDCS) that simulates real-life nursing experiences using virtual patients was evaluated. TDCS is an on-line interactive computer program that allows unlimited practice at any time in a risk-free environment without compromising patient care. Students are required to interact with on-line virtual patients through therapeutic conversation. Virtual patients were culturally diverse and of various ages.

OBJECTIVES

- Discuss the need for innovative pedagogy to better prepare nursing students for advanced clinical practice.
- Define three-dimensional computerized simulation, association with advanced nursing clinical assessment skills, and impact to clinical practice.
- Identify methods to inform collaboration with academia and healthcare facilities.



DESIGN/METHODS

Sample consisted of graduate nursing students taking Advanced Health Assessment class at a Midwestern University over three semesters (2014-2016). Sixty three graduate nursing students participated in this study. Integrative review of the literature was conducted on the use of computerized simulation as a teaching strategy for graduate nursing students. Selection criteria for TDCS program: designed for advanced practice, user friendly, cost effective, ability to provide feedback, and correlated with the universities nursing curriculum. Evaluation: pre/post survey included 10 questions using a five point Likert scale. First class day of semester, before introduction to TDCS, students had the opportunity to complete the survey. Last class day, after using TDCS for fourteen weeks, the same survey was administered. Formative evaluation was also conducted with students and categorized into themes. Surveys were evaluated using Bowker's Test for Symmetry of Disagreement.

RESULTS

		Post-Test				
		Strongly Disagree	Somewhat Disagree	Neither Agree/Disagree	Somewhat Agree	Strongly Agree
Pre-Test	Strongly Disagree				1	1
	Somewhat Disagree				9	7
	Neither Agree/Disagree				5	5
	Somewhat Agree				10	19
	Strongly Agree					2

- N=59; three had no post-test value and were removed from analysis.
- Gray cells: no change from pre-test to post-test. Yellow cells: positive change.
- All changes were positive; 47 students showed some level of positive change on the Likert scale.
- Eighteen (1 + 1 + 9 + 7 = 18) showed considerable positive change.
- Bowker's Test for Symmetry of Disagreement: highly significant (p-value < 0.0001).

Survey Question (Q)	Bowker's Test	Outcomes/Sample (n)
Confidence to take/perform: Q 1-4	Disagreement of Symmetry	Significant positive change: Q 1-4
1. Health history	ChiSquare 47 p<.0001	(59)
2. Physical exams	ChiSquare 47 p<.0001	(59)
3. Physical tests	ChiSquare 49 p<.0001	(59)
4. Identification of findings	ChiSquare 37 p<.0001	(40)
Virtual patient simulations: (Questions 5-10)		Positive change in Q 5, 7-10; Q6 not significant
5. Easy to use	ChiSquare 47 p<.0001	negative change (4) positive change (48)
6. Simulate real patients	ChiSquare 13 p<.2367	no change (28) negative change (8) positive change (23)
7. Facilitate learning of history taking	ChiSquare 21 p<.0018	no change (1) positive change (57)
8. Facilitate learning of advanced skills	ChiSquare 18 p<.0062	no change (3) positive change (56)
9. Allow practice of data analysis and developing diagnoses	ChiSquare 27 p<.0018	no change (29) negative change (1) positive change (41)
10. Allow for self-reflection	ChiSquare 27 p<.0001	no change (1) positive change (54)

Positive (Themes)	Areas for Improvement (Themes)
Strengthened use of therapeutic conversation;	Takes time to complete each module; too much
Health History/Cardiac/Pulmonary most helpful	documentation; couldn't get to the problem without asking a lot of questions

CONCLUSIONS

Literature supports the need for testing innovative pedagogy to prepare students for clinical practice. Studies have demonstrated that computerized simulation may be beneficial in student's perceived self-efficacy in a variety of skills, knowledge of leadership styles, and assessment and management of patients. Statistical findings from this study are highly significant and formative evaluation overall was positive. TDCS is one pedagogy that positively influences graduate nursing students preparation for clinical practice. Ongoing evaluation of TDCS and other innovative pedagogies is recommended.

REFERENCES: SEE HANDOUTS