Perceptions of the Effectiveness of Virtual Reality Simulation versus In-person Simulation Using a Standardized Patient Among Undergraduate Nursing Students as a Method of Educational Instruction: A Comparative Study

Jessica Seich MSN, RN, CPN, CHSE, Shelly Curran PhD, APRN-CNS CRRN

Byers School of Nursing; Walsh University, North Canton OH 44720

Introduction/Background

Simulation has been used in nursing education for many years as a way to augment traditional methods of educational instruction. The method of providing simulation experiences has changed over the years as technology has advanced. Simulation using case studies, and low-fidelity mannequins became more commonly used in the early 2000s, followed by the introduction of standardized patients, high-fidelity mannequins and more recently, the use of virtual reality (VR) simulation.

Simulation is an interactive teaching method that promotes learning through practice that can be transferred to the clinical setting. It is also useful in providing a safe space for students to learn and make mistakes, and allow for opportunities to care for uncommonly seen cases, or high-risk patients.

This study will focus on understanding student perceptions of the effectiveness of two different types of simulation experiences (VR versus simulation using a standardized patient).

Purpose

The purpose of this study is to compare virtual reality simulation versus in-person simulation using a standardized patient as a method of educational instruction for undergraduate nursing students.

Research Questions

1. Are undergraduate nursing student's "perception of effectiveness" ratings of educational sessions using simulation better for students in the VR group or standardized patient group?

2. Do "perception of effectiveness" ratings for each group (VR group versus in-person simulation with a standardized patient simulation group) differ based on demographic characteristics?

Methods/Procedures

Design: Quasi-experimental, comparative post-test design.
Setting: Walsh University Beyers School of Nursing simulation lab.
Sample: A convenience sample of students enrolled in the Families II pediatric course will be recruited.
Inclusion criteria: 18 years and older, undergraduate nursing students enrolled in Families II (Pediatrics) course at Walsh University.
Exclusion criteria: Students who verbalize they are unable to tolerate the VR simulation experience.
Procedures: Students are assigned to either in-person simulation using a standardized patient or VR simulation followed by completion of the Standardized Effectiveness Tool – Modified (SET-M).
Measures: Demographic characteristics (age, gender, ethnicity)
Perception of the effectiveness of simulation experience using the SET-M, a 19 question 3 poin Likert scale survey, The survey includes 3 sections: pre-brief (2-questions), scenario (12-questions), and debrief (5- questions). Higher scores indicate higher perceptions of effectiveness.

Lesson Title: Caring for a Pediatric Patient Experiencing Pain
Objectives:
1. Interpret vital signs for a pediatric patient
2. Perform an appropriate pain assessment for a pediatric patient
3. Safely administer analgesics to a pediatric patient using accurate math calculations
4. Tailor therapeutic communication for a pediatric patient
5. Encourage non-pharmacological pain interventions

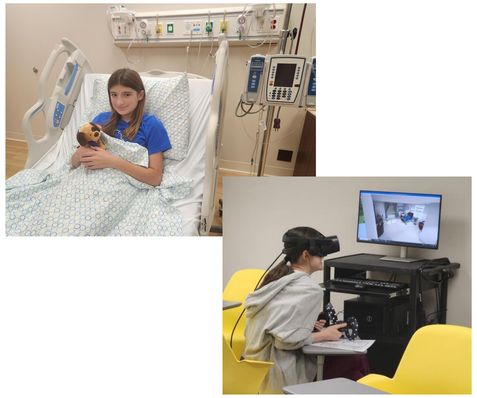
Both simulation experiences included a pre-brief, learning session, debrief, and post evaluation

Results

Demographic Data & Experience with Simulation

Variable	Standardized Patient *n* = 23	Virtual Reality *n* = 29
Age	26.57 (7.84)	24.48 (5.73)
Gender		
Female	18 (78.3%)	24 (82.8%)
Male	5 (21.7%)	5 (17.2%)
Ethnicity		
White	20 (87.0%)	26 (89.7%)
Black	2 (8.7%)	1 (3.4%)
Asian	1 (4.3%)	1 (3.4%)
Hispanic		1 (3.4)
Times participated in VR in learning environment	2.05 (4.21)	1.50 (1.26)
Times participated in VR for entertainment	1.32 (1.96)	1.36 (2.15)
Times participated in Simulation With Standardized Patient In learning environment	3.67 (2.54)	4.93 (3.52)

Note. VR = Virtual Reality; Continuous data reported a mean (Standard Deviation); Nominal Data reported as a frequency (percentage).



Perceptions of Effectiveness of Simulation Based on (SET-M)

Survey Question	Standardized Patient *n* = 23	Virtual Reality *n* = 29
Prebriefing		
Prebriefing increased confidence	2.83 (.49)	2.59 (.57)
Prebriefing beneficial	2.87 (.34)	2.72 (.53)
Scenario		
Prepared for changes in patient condition	2.78 (.42)	2.55 (.63)
Understanding of pathophysiology	2.70 (.56)	2.41 (.78)
Confidence in assessment skills	2.83 (.39)	2.62 (.56)
Empowered to make clinical decisions	2.65 (.49)	2.52 (.57)
Better understanding of medications	2.52 (.67)	2.34 (.77)
Opportunity to practice clinical skills	2.96 (.21)	2.76 (.58)
Confidence in prioritizing care & interventions	2.91 (.29)	2.59 (.63)
Confidence communication with patient	2.96 (.21)	2.41 (.73)
Confidence to teach patients re illness/interventions	2.57 (.59)	2.34 (.77)
Confident in ability to report to healthcare team	2.74 (.45)	2.41 (.78)
Confident in providing interventions to foster safety	2.83 (.39)	2.55 (.63)
Confident in using EBP to provide care	2.74 (.45)	2.52 (.57)
Debriefing		
Contributed to learning	3.00 (.00)	2.86 (.34)
Allowed communication of feelings before focusing on scenario	3.00 (.00)	2.76 (.58)
Valuable in helping improve my clinical judgement	2.91 (.29)	2.86 (.44)
Provided opportunities to self-reflect on performance	2.96 (.21)	2.79 (.56)
Constructive evaluation of the simulation	2.96 (.21)	2.83 (.54)

Comments from Students Participating in the VR Simulation:
- I honestly feel like using a live person or even a mannequin is more practical than trying to familiarize yourself to the realm of VR. Some people may pick up on it quick, and others may never truly grasp the full potential.
- I feel that with more practice VR Sim would be extremely beneficial!
- The VR simulation is pretty easy to use and allows you to gain experience without physically being in the clinical rotation. Also the debriefing is very valuable and contributed to the majority of my education for the experience.
- Great simulation and learning experience, a little disorienting though.

Comments from Students Participating in the Standardized Patient Simulation:
- Really enjoyed interacting with a real patient
- It was great!
- The real in person rather than a "dummy" was more beneficial.
- I prefer to do a simulation on a person rather than virtual