Presentation Objectives

• List challenges to delivery of clinical education opportunities and how simulation technology may ease these challenges
• Describe various types of simulations, including virtual learning environments
• Summarize study results that highlight the effects on targeted outcomes (e.g., communication skills, knowledge and confidence, empathy) after interacting with one of three designated clinical training conditions (i.e., virtual patient, trained patient actor, or nursing home resident)

Current Challenges

• Deliberate and distributed practice enhances learning and retention, but challenging to provide multiple practice venues for all students
• Need for flexibility to accommodate learning styles and pace, but some students need more time to learn skills
• Need to standardized assessment of learning outcomes, but time-consuming to do this 1:1

Overcoming Barriers

• Simulations offer a possible solution to this logistical and scheduling bottleneck
• Simulations allow for individualized learning and practice, and standardized assessment opportunities
• Replication, Replication, Replication

deCarvalho, et al., 2010

Disclosures

Dr. Brundage received a consultant fee from Citrine Technologies, Inc and a Research Fellowship from Curtin University in 2014.

Dr. Beilby has no financial or non-financial disclosures.

Ms. Quail and Mr. Allen have no financial or non-financial disclosures.

Dr. Spitalnick, CEO of Citrine Technologies, LLC received salary support from Curtin University via a grant obtained by Dr. Beilby and Citrine Technologies co-owns intellectual property rights to the developed technology. He has no relevant non-financial relationships.
Simulation technologies

Integrated Simulators:
Manikins that mimic physical and/or physiological signs of a disease

Simulated patients:
Actors trained to represent characteristics of a disease in a reliable manner

Simulated environments:
Re-creation of clinical environments where the learner engages in some form of learning activity. Typically 2-D.

Virtual reality systems:
Recreation of complex (3-D) environments via human-computer interface (Haptic, HMD).

Many types of simulation

Integrated Simulators:

Simulated patients:

Simulated environments:

Virtual reality systems:

Adapted from Yeung, Dubrowski, & Carnahan, 2013, p. 230
Simulation

- Recent meta-analyses (Consorti, et al., 2012; Cook, et al., 2010; Harder, 2010) indicate that using virtual patients, either as stand-alone learning opportunities or in conjunction with classroom-based instruction, improves
- Students’ knowledge and skills outcomes
- Confidence and
- Clinical reasoning, ethical decision making, and communication skills

Simulation Applications: Medical Procedures

Laparoscopic surgery (Bashir, 2010)
Coronary bypass surgery/rehab (Chuang et al., 2006)
Hip replacement surgery (Handels et al., 2000)
Dental Anesthesia (Hanson & Shelton, 2008)
Cardiac Life Support (Tawalbeh et al., 2013)
Tracheostomy training (Ward et al., 2014)

Simulation Applications: Behavioral Skills Training

For Improving:
- Interviewing Skills (Sweigart, et al., 2014)
- Clinician-client interactions (Riva, et al., 1998)
- Inter-professional competencies (King et al., 2014)
- Health assessments (Luctkar et al., 2012)

Macro benefits of simulation:

Transfers to real-world environments
- (Emmelcamp, et al., 2002; Gallagher, et al., 2013; Huet et al., 2009; Rose, et al., 2000; Seymour, et al., 2002)
- Without loss of clinical effectiveness, simulation offers an alternative that can be as or more efficient, available, and scalable (Watson et al., 2012)

Research Study

The project team

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Our Questions

Can we develop a systematic and controlled new method of delivery that teaches essential communication skills and empathy to students??

If we do, will this new system offer an equivalent or better method of teaching communication and empathy to health care providers??

Specific Research questions

Are there differences in self-rated knowledge, skills, and confidence between interactions with a virtual patient, trained actor, and nursing home resident?

Does self-rated empathy differ across the virtual patient, trained actor, and nursing home resident conditions?

Participants and Procedures

62 third-year undergraduate Speech Pathology students
Randomized to one of 3 conditions

1. Nursing home resident
2. Patient Actor in simulated nursing home setting
3. Virtual Human in a virtual learning environment

Clinical Educator present for each condition

Procedures

Patient actor posing as patient
Resident at an aged-care facility
Virtual patient in a virtual learning environment

The virtual environment & patient

https://www.youtube.com/watch?v=qL4BXXX1AX4

The environment
Welcome

Measures
Pre and post placement visual-analog rating scales of
- Communication knowledge, skills, and confidence
- Based on the Four Habits Coding Scheme, a reliable measure of clinician’s communication behaviors
  - Invest in the beginning
  - Elicit the patient’s perspective
  - Demonstrate empathy
  - Invest in the end

- Jefferson Scale of Empathy – Health Professions Student version (Jefferson Medical College, 2009)
- Rating of the clinical experience (post only)

Sample questions for knowledge, skills & confidence
- “Initiate a conversation with a client regarding their concerns”
- “Obtain a list of a client’s primary concerns”
- “Establish rapport with a client”
- Explain your professional role to a client.
- Cope with a situation in which a client reacts emotionally to the information you have given them.

Sample questions: Jefferson Scale of Empathy
7-point Likert scale (strongly disagree—strongly agree)
- “Attention to patients’ emotions is not important in patient interview”
- Patients feel better when their health care providers understand their feelings
- Empathy is a therapeutic skills without which a health care provider’s success is limited.

Sample questions: rating the experience
I did not learn much by participating in this experience.

The experience helped me to learn how to interact with real patients.

My skills have improved after participating in this experience.

The clinical educator facilitated my learning experience.
There were no identified statistical differences among the three groups in assessing the following self-report perceived experiences:

- Amount of learning.
- Usefulness of the experience in learning how to interact with real patients.
- Skills improvement.
- Value of the clinical educator.

Tough questions and comments
For all three groups:

Significant, medium to large, positive changes from pre- to post ratings for:

Knowledge
Skills
Confidence

Summary

Similar to other studies, students in our study learned in the simulation and actor conditions but did not find these as realistic as the nursing home condition

Students were not as challenged by the nursing home condition

Summary: Clinical Education

VLEs show promise in clinical education
The virtual human needs more responses in order to be 'ready for prime time' clinical interactions
Need to carry out external evaluation of students’ skills post interactions
Learning to deal with those ‘uncomfortable silences’ when patients do not respond

What’s next?

• Funding from Alzheimer’s Australia to develop a simulation-based training program for caregivers of persons with dementia
• Adding more characters, contexts and utterances to make the interaction more authentic
• “Jim” is currently at work in the SLP clinic at Curtin University

Take home message

VLEs allows for clients and students to practice skills in environments that are:

Safe (for the student and the patient)
Controlled
Confidential
Repeatable

Thank you

Questions?
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