Using 21ST Century Technology and Innovation to Increase Simulation Capacity

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INACSL is an accredited ANCC provider.
• Conflict of Interest
  – Funding was received by the Texas Higher Education Coordinating Board
  – Judy LeFlore
  – Mary Mancini
  – Daisha Cipher
  – Mindi Anderson – current grant funding Laerdal Foundation for Acute Medicine; previous consultant National League for Nursing/Laerdal-scenario development; Advisory Board-vSim® for Nursing/Pediatric
  – Meagan Rogers
  – Jeanette Blankenship
  – Julia Greenawalt (INACSL Conference Administrator & Nurse Planner) reports no conflict of interest
  – Leann Horsley (INACSL Lead Nurse Planner) reports no conflict of interest
Successful Completion

• Attend 90% of session
• Complete online evaluation
Upon completion of this presentation, participants will be able to:

1. Name three outcomes from a study comparing screen-based simulation to mannequin-based /task-trainer simulation for 50% of pediatric (peds) clinical as compared to a control group.
2. Discuss at least two lessons learned from increasing simulation in peds clinicals to 50%.
3. Describe at least one recommendation to institutions considering increasing simulation to half of a clinical course.
• Nationally:
  – Clinical placements problematic
    - Decrease in pediatric inpatient admissions (Agency for Healthcare Research and Quality, 2014)
    - Increase in nursing enrollment (American Association of Colleges of Nursing, 2016)
  – National Council of State Boards of Nursing (NCSBN) study – showed 50% of clinical can be substituted - similar outcomes (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014)
• Locally/institutionally:
  – Over 9,000 pre-licensure students
  • On-campus (in-seat) and off-campus (online)
  – Resources inadequate for growth
  – Pediatric clinical placement difficult
  – Simulation challenging in the online environment
• Received funding from Texas Higher Education Coordinating Board
• Allowed purchase of additional simulation equipment and faculty/staff for study
• Screen-based simulation (vSim®) purchased by other means
To accommodate the increased capacity of students, while expanding their exposure to quality clinical encounters in a simulated environment

- Increase capacity for simulation
- Decrease clinical hours
- Provide deliberate practice opportunities
Specific Goals

1. Increase the number of simulated hours in pediatric clinical (on and off-campus); increase to 50%.

2. Compare pedi HESI score, clinical pass/fail, and first time NCLEX pass rate for a group of off-campus students who received 50% screen-based simulation to an off-campus group with customary clinical instruction.
• 3. Compare pedi HESI score, clinical pass/fail, and first time NCLEX pass rate for a group of on-campus students who received 50% screen-based simulation to an on-campus group with customary clinical instruction.

• 4. Compare pedi HESI score, clinical pass/fail, and first time NCLEX pass rate for a group of on-campus students who received 50% mannequin-based/task trainer simulation to an on-campus group with customary clinical instruction.
Methods

• Prospective cohort study (limitation – unable to randomize).
• Replacement of 50% of clinical experience with either screen-based simulation or mannequin-based/task trainer simulation.
• Use of validated scenarios (same scenarios both groups).
• On and off-campus pre-licensure nursing students during their pediatric rotation.
• Included one semester control group for off-campus; one semester control group for on-campus.
• Cohort 1 – off-campus students, one semester (50% screen-based).
• Cohort 2 - off-campus students, one semester (50% screen-based).
• Cohort 3 – on-campus students, one semester (half 50% screen-based; half 50% mannequin/task-trainer based).
Outcomes/Tools

• Demographics – gender, age, race, ethnicity, education level.
• Pedi HESI score (two types).
• Clinical pass/fail (pedi).
• First-time NCLEX pass rate.
• Satisfaction/usability – for 50% simulation groups; adapted from Laerdal Medical.
491 Participants

- 42 Mannequin
- 248 Screen-based
- 201 Control
Demographics

- Mean age 29 years
- 82.9% Female
- 47% White/Caucasian, 17.7% Hispanic, 19.1% Black/African-American, 9.6% Asian/Pacific Islander, 6.5% other
86.9% passed Pediatric HESI
Mean 81.6 (SD = 9.9)

Mannequin: $\bar{X} = 84.1$, 95.2% passed
Screen-based: $\bar{X} = 82.5$, 88.3% passed
Control: $\bar{X} = 80.0$, 83.5% passed
Summary

• Both Mannequin and Screen-based students performed significantly higher on HESI than the Control students.

• No significant difference between Mannequin and Screen-based.

• Significantly more Mannequin-based students passed the HESI than the Control students.

• No difference between Mannequin and Screen-based, or Screen-based and Control on passing HESI.
Limitations

• Unable to randomize groups.
• Differences in “pass” score on screen-based simulation for on and off-campus students.
• Technical difficulties/inadequacies.
• “Group” effort? always a possibility in the online environment.
• “Group” effort in mannequin-based limits individualized learning outcomes.
Lessons Learned

• On-Campus
  – Variation in learning outcomes for mannequin-based and screen-based simulation:
    • i.e. same scenario, but patient education focus with mannequin-based and task-oriented in screen-based.
Lessons Learned

• Off-campus
  – Learning curve with instructors.
  – Synchronous debriefing scheduling a challenge, although it provided a way to build community in the on-line groups.
  – Technical difficulties always an issue.
  – Repetition is a good thing.
Conclusions

• Exposing students to screen-based and mannequin-based/task-trainer simulations, education and competency will be enhanced.

• Consistent clinical situation exposure provided by screen-based and mannequin-based scenarios will ensure students all get to experience a variety of patient care experiences.
• Screen-based simulation provides a method to provide simulation in an on-line program/course that may not be able to be accomplished otherwise.

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