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The Role of Simulation in Nursing Education: A Regulatory Perspective

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Goals

- Compare and contrast different types of simulation
- Identify potential advantages/disadvantages of simulation as a teaching strategy over actual clinical experience
- Discuss the use of simulation as an evaluation tool

Simulation

- Simulation:
  - "… as a strategy – not a technology – to mirror, anticipate, or amplify real situations with guided experiences in a fully interactive way."
- Simulator:
  - "…replicates a task environment with sufficient realism to serve a desired purpose"

-(http://www.ahrq.gov)

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The Role of Simulation

- A teaching strategy
- An evaluation tool

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Trends in Nursing Education

- Providing more experiential learning opportunity than instruction
- Increased use of learning technology
- More emphasis on outcome-based then process-based education
- More evidence-based education strategies and curriculum

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NCSBN Supports

"…the inclusion of innovative teaching strategies that complement clinical experiences for entry into practice competency."

– NCSBN position paper on clinical education, 2005

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Rationale

- To ensure patient safety
- To promote better preparation of new nurses
- To support innovative teaching strategies
- To overcome faculty and preceptor shortages and lack of clinical sites

Types Of Simulation

- Screen-based/PC-based simulation
- Virtual patients
- Partial task trainers
- Human patient simulator
- Standardized patients
- Integrated models

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Principles of Selecting Type of Simulation to Use

- Should be driven by the educational goal/objective
- Should match the level of the student
- The higher the realism, the more effective it is in engaging the student

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Strengths and Limitations of Different Types of Simulation

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1. PC-Based Simulation

Strengths

- Easy, flexible and unlimited access
- Useful for knowledge acquisition and critical thinking
- Accommodating to individual pace of learning
- Good for lower/entry level students
- Relatively low cost

Limitations

- No physical interactivity
- Low fidelity
- No experiential learning

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2. Virtual Patient Simulation

Strengths

- Easy access
- Economic for teaching multidisciplinary care
- Accommodating to individual pace of learning
- Good for lower level of students

Limitations

- Limited physical interactivity
- Low fidelity
- Limited experiential learning

3. Task Trainers

Strengths

- Low cost
- Good for procedural practice

Limitations

- Low fidelity

4. Human Patient Simulation

Strengths

- High fidelity
- Interactive experience
- Animating theoretical knowledge within the context of clinical reality
- Using emotional and sensory components of learning
- Good for critical thinking, decision-making and delegation
- Good for knowledge integration and higher levels of students

Limitations

- Costly
- Limited access
- Dependent on availability of human instructors/operators
- Limited realistic human interactions

5. Standardized Patient (SP)

Strengths

- Higher realism in the interpersonal and emotional responses
- Good for communication skills and interpersonal relationships training
- Good for evaluation

Limitations

- Signs do not match symptoms
- Inversed power dynamic

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Principles should stay consistent
but strategies flexible.

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Factors Facilitating Teaching with High-Fidelity Simulation

- Feedback
- Repetitive practice
- Curriculum integration
- Range of difficulty level
- Multiple learning strategies
- Capture clinical variation
- Controlled environment
- Individualized learning
- Defined outcomes or benchmarks
- Simulator validity

Issenberg et al, 2005

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Simulation Fidelity

- The physical, contextual, and emotional realism that allows persons to experience a simulation as if they were operating in an actual healthcare activity.

- 2007 SSH summit

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A Question for Regulation

- What is the role of simulation in nursing education in relation to clinical education?

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Potential Advantages of Simulation Over Actual Clinical Experience

- Reduces training variability and increases standardization
- Guarantees experience for every students
- Can be customized for individualized learning
- Is more accurate reflective learning especially with HPS
- Is student-centered learning
- Allows independent critical-thinking and decision-making, and delegation
- Allows Immediate feedback

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Potential Advantages of Simulation Over Actual Clinical Experience (cont.)

- Offers opportunity to practice rare and critical events
- Can be designed and manipulated
- Allows calibration and update
- Can be reproduced
- Occurs on schedule
- Offers opportunities to make and learn from mistakes
- Is safe and respectful for patients
- Allows deliberative practice
- Also uses the concept of experiential learning

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" Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand."

- Confucius, 450 BC

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Limitations of Simulation Compared to Actual Clinical Experience

- Not real
- Limited realistic human interaction
- Students may not take it seriously
- No/incomplete physiological symptoms

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Vision for the Future: Continuum of Learning

Class → Simulation → Clinical→ Real world

- Integrated into mainstream healthcare education

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Simulation as a Teaching Strategy: Challenges

- Initial capital expenditures
- High financial cost
- Faculty development
- Ongoing faculty/administrative/technical support

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Research on Simulation:

Kirkpatrick Criteria (1998)

- Reaction
- Learning
- Behavior
- Results

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Future Research: Simulation as a teaching strategy

- Impact on competence
- Impact on patient care

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NCSBN's Research Initiative on Simulation

- Goal: To explore the role of high fidelity simulation in basic nursing education in relation to real clinical experience

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The Question

- Can high fidelity simulation experience be counted as real bed-side clinical experience?

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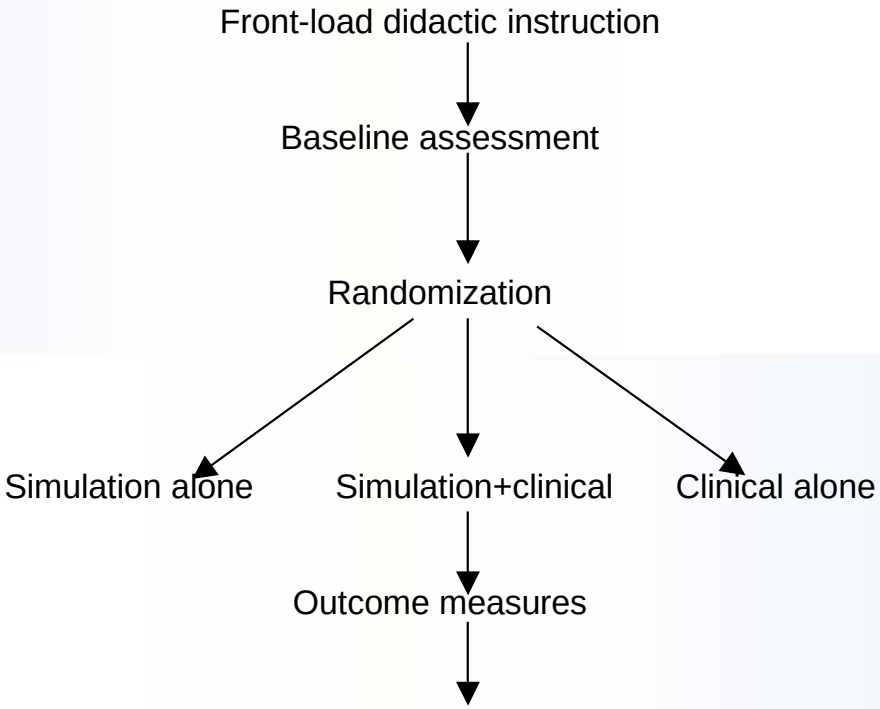
Specific Objective

- Compare and contrast the effects of simulation alone and in combination with clinical experience on knowledge acquisition/retention, self-confidence, and clinical performance

Design

- A randomized controlled study with repeated measures pre- and post-simulation/clinical to compare the effect of simulation alone and in combination with clinical on knowledge acquisition/retention, self-confidence, and clinical performance.

Figure 1. Study Scheme



1. Knowledge acquisition/retention
2. Self-confidence
3. Clinical performance via standardized patient

Groups

1. Simulation without clinical (30 hours of simulation)
2. Simulation + clinical (15 hours of simulation and 15 hours of clinical)
3. Clinical without simulation (30 hrs of clinical)

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Outcome Measures

- Knowledge acquisition/retention
- Confidence
- Clinical performance

Knowledge acquisition/retention

- Assessed with written examinations before (after didactic instruction, which is frontloaded) and after clinical/simulation experiences.
- The examinations were equivalent in content.

Confidence

- Assessed with a Likert-type self-confidence scale which consisted of 12 items.
- Reflect the student's confidence in assessing, intervening and evaluating pts with critical illness.

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Performance Evaluation with SPs

- Three stations
- Each station provided one scenario
- 10-15 min each scenario
- Focused on symptom recognition, assessment and intervention
- Performance evaluated by a faculty member on-site and videotaped for further analysis by two additional faculty members
- Staff: 6 faculty and 6 SPs

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Format

- All students enrolled in the course
- Occur over 2 days
- Rush CON labs
- Each student – 3 scenarios using SPs
- One hour commitment for each students

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Each Station

- Has the chart outside the pt room
- The chart has info on pt hx, meds etc
- Each pt room has essential equipment
- Faculty member acts as evaluator and MDs if needed

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Three Scenarios

- A pt with CP (hx of knee replacement)
- A pt with sudden onset of SOB (hx of abdominal surgery)
- A pt with a change of LOC (hx of fall at night)

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A Survey of Boards of Nursing
Nehring, 2006

- Purpose: examine the status of regulation changes concerning the use of simulation in nursing programs and if no regulation changes, the presence of approval for use of simulation
- 44 states plus the District of Columbia, and Puerto Rico participated

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A Survey of Boards of Nursing (cont.)

- Five states and Puerto Rico have changed nursing regulations to allow a percentage of clinical time with the simulators (Nehring, 2006)
- One state specified a percentage of 10% of clinical time to be replaced by simulation experience (Nehring, 2006)

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A Survey of Boards of Nursing (cont.)

- While no changes in regulation, 16 states give permission for schools to use a percentage of their clinical time with the simulation experience (Nehring, 2006)
- The percentage is determined on a case-by-case basis (Nehring, 2006)

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The Role of Simulation

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- A competence assessment tool

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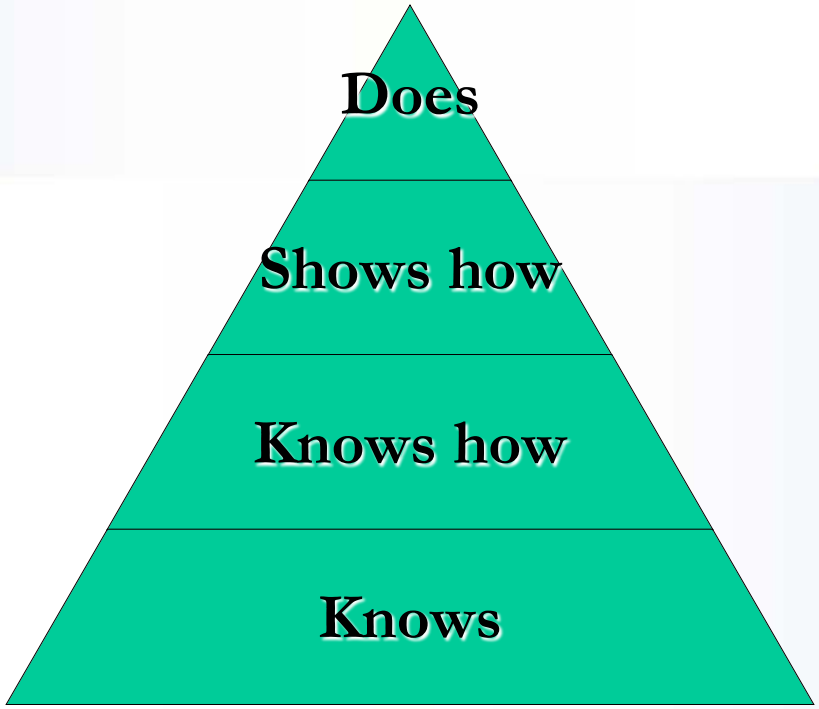
Competency Assessment: Miller's Pyramid (1990)



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Common Assessment Methods

- Written exam (MCQ)
- Checklist evaluation
- Portfolios/Record review (e.g., skill's checklist)
- Simulations (Standardized patients and models)

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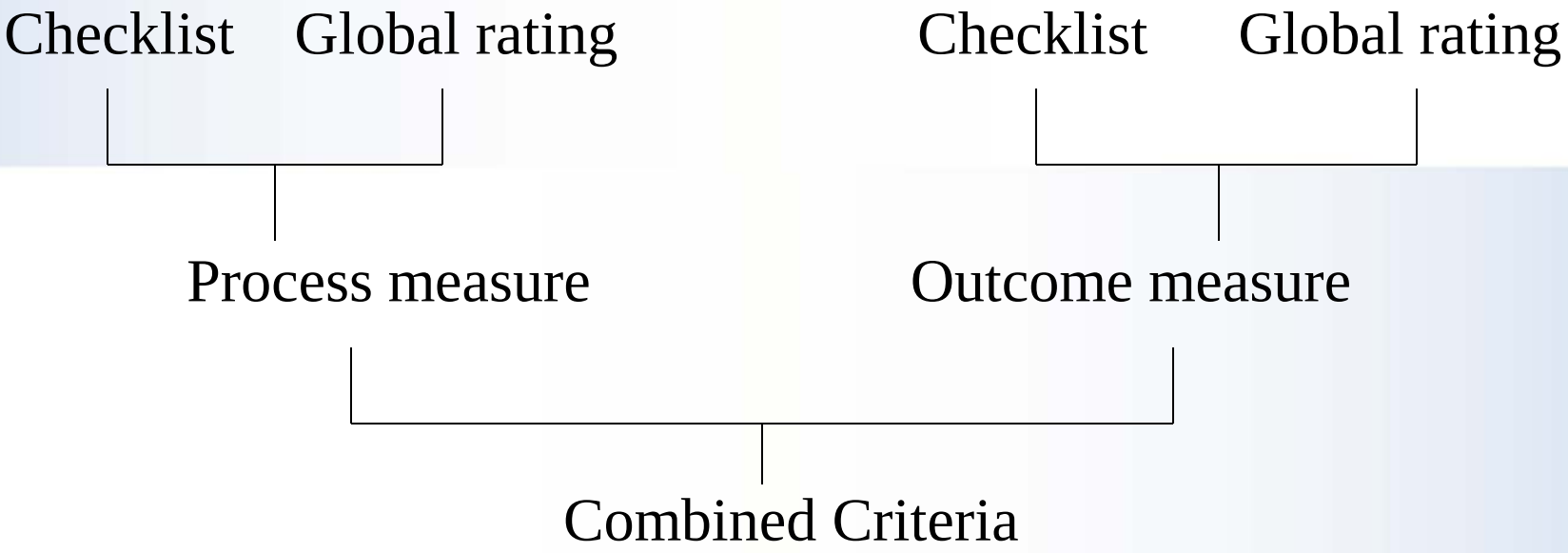
Common Assessment Model with Simulation



Types of Simulation Models for Competency Assessment

- OSCE
- Computer-based simulation
- Computerized mannequin

Potential Advantages of Using Simulation for Assessment

- Able to measure more than knowledge level
- Performance-based
- Standardized (same conditions for all test takers)
- Measures integrated KSA

Challenges of Using Simulation as an Assessment Tool

- Measurement issues
  - Reliability
  - Validity
- Cost
- Feasibility

Future Research: Simulation as an Assessment Tool

- Establish valid content, structure and scoring metrics
- Cost-effectiveness compared to other tools

The Future

- Integrated models for both teaching and assessment using simulation
- Setting standards and guidelines for various kinds of learning and assessment

Contact Information

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