Promoting Safe Medication Administration Using Simulation

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Disclosures

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- All Authors identify no Conflicts of Interest

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Objectives

Upon completion of this presentation, participants will be able to:

- implement an enhanced medication administration program of simulation,
- discuss the effect of an enhanced medication administration program of simulation on student nurses' knowledge & competency related to safe medication administration, &
- explain the implications this study has for nursing education & patient safety.

Background

- Nurses play a major role in contributing to safe, quality patient care.
- Safety is one of the six Quality & Safety Education for Nurses (QSEN) competencies.
- Student nurses & new graduates have deficiencies in knowledge, competency, & judgments related to safe administration of medications.
- Simulation facilitates learning of skills, skill competency, priority-setting, & decision-making.

Aims of the Study

- Conduct psychometric & pilot testing of two new instruments to evaluate student knowledge & competency related to safe medication administration
- Pilot test new & revised simulation scenarios with a medication safety focus
- Measure the differences in scores on 1) knowledge, 2) competency, 3) perceptions, & 4) comfort for nursing students who did & did not participate in medication safety enhanced simulation based learning experiences (MSE-SBLEs)

Research Questions

Does a medication safety enhanced program of simulation increase students':

1. knowledge of medication safety?
2. competency in administering medications safely?
3. perceptions & comfort related to administering medications safely?

Medication Safety Enhanced Simulation Based Learning Experiences (MSE-SBLEs)

- 14-week junior-level Medical-Surgical clinical course
- Medication safety enhanced debriefing for existing simulations (Medication Skills Lab & GI bleed/ post-op hip)
- Development & Implementation of new MSE-SBLE (administration of medications to two patients)

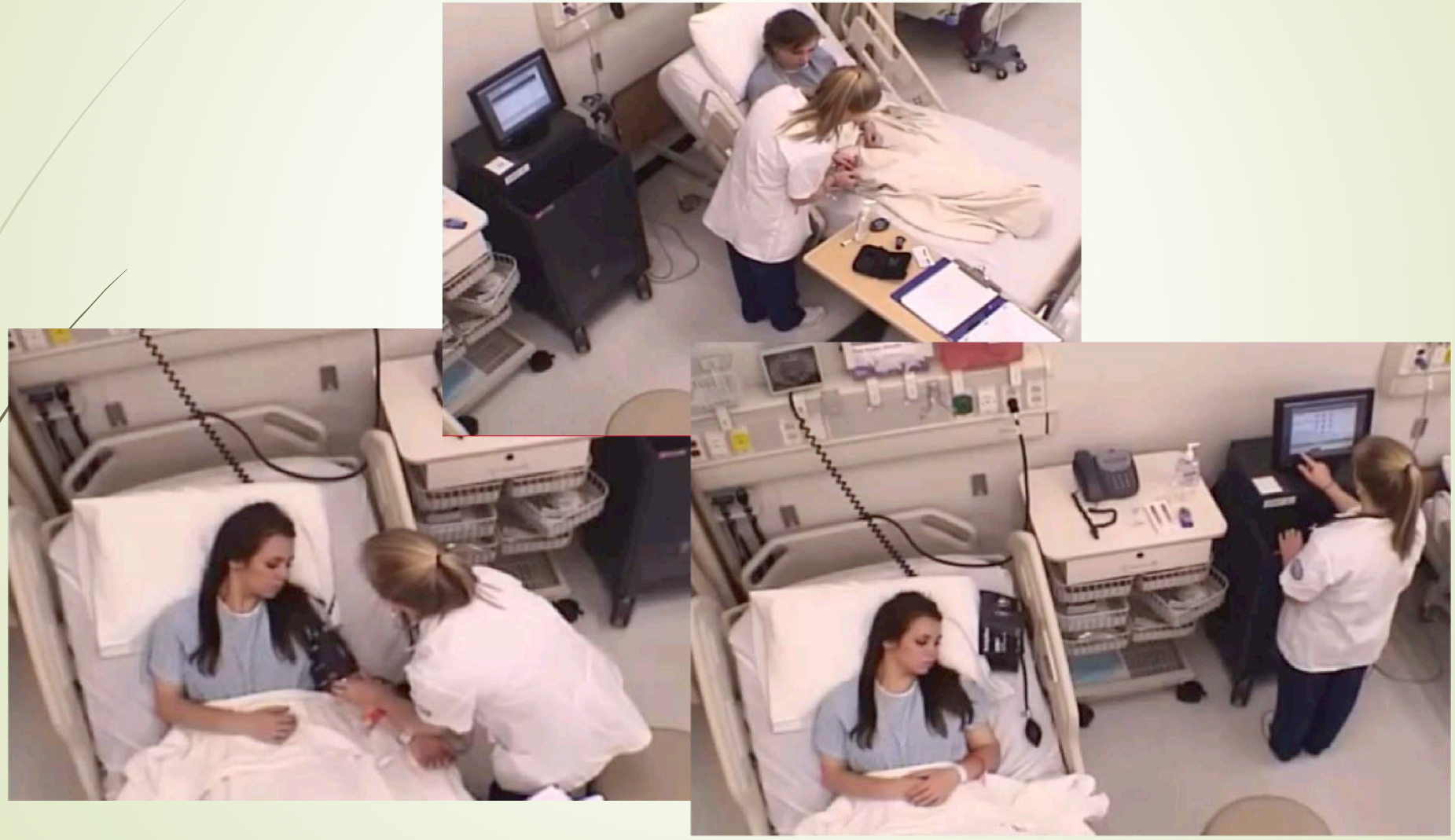
SBLE #1:
Medication Skills Lab

- Early in the semester
- Students practiced/reviewed medication administration:
  - IV medications
  - subcutaneous & intramuscular injections
  - giving medications through a feeding tube
  - using a medication dispensing cart
  - giving eye drops
- MSE- added medication-safety focused 30-min. debriefing

SBLE #2:
Administering Medications to Two Patients

- New MSE-SBLE
- Mid-point of semester
- Focused on critical aspects of safe medication administration
- Students individually administered medications to two Standardized Patients (SPs) within 20 minutes
- Debriefed in groups of 4-6 students

Administering Medications to Two Patients



SBLE #3:
GI Bleed and Post-Op Hip

- Late in the semester
- High-fidelity manikins
- Two 20 minute simulations with 40 minute debriefing each
- Student pairs worked as nurse or observers
- Students had to complete an assessment, note abnormalities, call the healthcare provider, & administer medications
- MSE- Debriefing included medication safety

Instrument # 1: Medication Safety Knowledge Assessment (MSKA)

- Researcher-developed 25-question multiple choice criterion-referenced knowledge assessment
  - Pass/Fail Cut score (≥ 21 = pass; < 21 = fail)
- Pilot test
  - Validity
    - CVI= 0.94
  - Reliability
    - Pre-test: *r*= 0.83
    - Post-test: *r*= 0.96

Instrument # 2: Medication Safety Critical Element Checklist (MSCEC)

- Researcher-developed 11-item checklist based on the critical elements of safely administering medications

- Pilot test
  - Validity
    - CVI= 0.92
  - Inter-rater reliability
    - $r > 0.9$

Instrument # 3: Healthcare Professionals Patient Safety Assessment (HPPSA)

- Part 1 (17 items)
  - Level of agreement with statements about errors & safety in healthcare
  - Likert Scale 1-5
- Part 2 (5 items)
  - Comfort level with reporting & disclosing an error
  - Likert Scale 1-5

- Pilot test
  - Validity (All Parts)
    - CVI = .95
  - Reliability
    - Part 1: *r* = .73 [pre]/ *r* = .68 [post]
    - Part 2: *r* = .81 [pre]/ *r* = .79 [post]

Study Design

Pilot/Psychometric Testing Medication Safety Knowledge Assessment (MSKA) Psychometric Testing Healthcare Professional Patient Safety Assessment (HPPSA) Psychometric Testing Medication Safety Critical Element Checklist (MSCEC)	
Control Group	**Intervention Group**
HPPSA & MSKA Pre-test	HPPSA & MSKA Pre-test
Medication Skills Lab	Medication Safety Enhanced Medication Skills Lab
	Mid-Semester Additional Medication Safety Enhanced Simulation
GI & Post-op Hip Simulations MSCEC	Medication Safety Enhanced GI & Post-op Hip Simulations MSCEC
HPPSA & MSKA Post-test	HPPSA & MSKA Post-test

Sample & Setting

- Convenience sample
- First-semester Junior BSN students
- n= 86
- Gender
  - 95% female
- Ethnicity/race
  - 91% white, non-Hispanic

- Medium-sized Catholic University in mid-Atlantic region of U.S.

Data Analysis and Results: MSKA

- MSKA was analyzed based on a Knowledge Pass/Fail cut score (≥ 21 = pass; < 21 = fail)
- Crosstabs & Chi Square Analysis were performed
  - Pre-test: No statistically significant differences between control & intervention groups.
  - Post-test: Statistically significant differences found between the intervention & control groups.
    - $\chi^2 = 5.13$, $df = 1$, $p = .02$
- **Significant difference in knowledge of safe medication administration between students that received MSE-SBLE vs. those who did not.**

Data Analysis and Results: HPPSA

- The HPPSA scores were analyzed using paired t-tests.
  - No statistically significant differences were found.

- **No significant difference in perceptions & comfort with safe medication administration between students who received MSE-SBLE vs. those who did not.**

Data Analysis and Results: MSCEC

- MSCEC between group scores were compared
- Statistically significant differences were found between the intervention & control groups
  - $p = .028$, $t = 2.28$, $df = 45$
  - IRR = .96
  - Cronbach's Alpha was .69 to .72 for the two scenarios.

- **Statistically significance difference in safe medication administration competence between students who received MSE-SBLE vs. those who did not.**

Discussion

- Medication safety is crucial to ensuring patient safety
- Students who participated in the MSE-SBLEs scored significantly higher in knowledge & competency related to the medication safety compared to those who did not
- Anecdotally, students reported that they found the MSE-SBLEs helpful in understanding medication administration
  - For most students, these simulations were the only time they “independently” administered medications without a faculty member’s guidance

Discussion

- Outcomes of this study suggest that simulations focusing on medication safety may promote patient safety through increased knowledge & competency related to medication safety

- Faculty in the junior medical-surgical course at the study school adopted these additional medication safety simulations into the course

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Thank You!

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