Promoting Safe Medication Administration Using Simulation

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Disclosures

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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)
SBL#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 (MSC EC)

- 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

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<td>HPPSA &amp; MSKA Post-test</td>
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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.
    - $\chi^2 = 5.13, \text{ df} = 1, \ p = .02$
- 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:
MSC EC

- MSC EC 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
References


Thank You!

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