ENHANCING THE PATIENT SAFETY CULTURE OF ABSN STUDENTS THROUGH INSTRUCTION ON MEDICAL ERROR RECOVERY

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My name is Darlene Burke. The research study that I will be discussing today was completed in partial fulfillment of a Doctor of Philosophy Degree from Capella University. I currently serve as nursing faculty for San Diego State University and MiraCosta College. I have no relevant financial or nonfinancial relationships to disclose.
DEFINITIONS

- **Patient safety culture.** A “subset of organizational culture” (Feng et al., 2008) that represents “the importance of patient safety in the workplace as considered by the staff” (Abdolahzadeh et al., 2012) and is expressed in the “beliefs, attitudes, and values of an organization’s employees regarding the pursuit of safety” (Joint Commission, 2009).

- **Medical error recovery.** “Identifying, interrupting, and correcting medical errors” (Henneman et al., 2010).
BACKGROUND

- Attitudes to patient safety, which are the foundation of patient safety culture, are formulated during health professions training.

- Nursing faculty have been challenged in their efforts to enhance the patient safety culture of students because there is a lack of empirical evidence as to which teaching strategies positively affect student attitudes toward patient safety.
RESEARCH PROBLEM

More research is needed to find effective teaching strategies for faculty to use in promoting a culture supportive of patient safety among nursing students.
The purpose of this study (conducted in Summer 2013) was to measure the effect of an educational intervention that illuminates the role of nurses in recovering medical errors on the patient safety culture of students in an ABSN program.
RESEARCH QUESTION

Will patient safety culture, as measured by attitudes to patient safety, differ between ABSN students who participated in an educational intervention based on the concept of medical error recovery, and those who did not participate in the educational intervention?
HYPOTHESES

- There is a significant difference in the attitudes toward \textit{patient safety training}, when controlling statistically for the pretest.
- Error reporting confidence
- Working hours as cause of error
- Error inevitability
HYPOTHESES (CONT.)

- Professional incompetence as cause of error
- Team functioning
- Disclosure responsibility
- Patient & family’s role in error
- Importance of patient safety in the curriculum
THEORETICAL FRAMEWORK

- Reciprocal interactive view of patient safety culture in nursing (Feng et al., 2008)

- New middle range theory (proposed)

- Patient safety culture emerges from nurses understanding the dynamic reciprocal interaction among people, tasks, and systems in relation to patient safety.
RESEARCH DESIGN

- Quantitative methodology
- Quasi-experimental
- Nonequivalent (pre- and posttest) control-group design
SAMPLE

- Nonprobability sample from an ABSN program at one university located in the southwest U.S.
- Four student cohorts (155 students)
- Second, fourth (2 mirrored groups) & fifth semesters
- Main campus (1 cohort) and satellite campus (3 cohorts)
SAMPLE

- 4th semester cohorts = intervention group

- 2nd & 5th semester cohorts = control group

- Sample size (N=142); 40 (2nd), 67 (4th) & 35 (5th)

- Lost 4 participants from the intervention group to follow-up (n=138; 63=intervention; 75=control)
Attitudes to Patient Safety Questionnaire – APSQ III (Carruthers et al., 2009)

Nine subscales; 26 items; 5-point Likert-type scale

Overall Cronbach’s alpha of 0.73

Field tested for use with nursing students by three nurse educators, but was not pilot tested.
DATA COLLECTION

- **Week 1** – APSQ III (pre-test) was administered & demographic data obtained (4 cohorts)
  - Demographic data: gender, age & ethnicity

- **Week 2** - Educational intervention was conducted (2 cohorts= intervention group)

- **Week 5** - APQS III (posttest) was administered (4 cohorts)
EDUCATIONAL INTERVENTION

- Conducted over lunch period; 50-minutes

- Power point presentation/ note-taking handout for participants

- The Modified Eindhoven Model of Near-Miss Events (Henneman & Gawlinski, 2004) served as the foundation of the educational intervention.
EDUCATIONAL INTERVENTION

Teaching/learning methods:

- Story-telling & critical reflection
EDUCATIONAL INTERVENTION

Teaching/learning methods:
- Modified Eindhoven Model

This model was used to illustrate how technical, human operator, and organizational failure can result in medical errors.
Modified Eindhoven model.
Henneman & Gawlinski (2004)
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EDUCATIONAL INTERVENTION

Teaching/learning methods (cont.)

- Modified Eindhoven Model

  - Spurred discussion about the system defenses in hospitals that play a role in error prevention.

  - Elucidated the important role of nurses in medical error recovery.
Modified Eindhoven model.
Henneman & Gawlinski (2004)
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EDUCATIONAL INTERVENTION

- Teaching/learning methods (cont.)
  - Fact or fiction exercise
  - Case study analysis (small groups)
  - Discussion of “good-catch programs”
  - Role play interrupting an error
EDUCATIONAL INTERVENTION

- Dimensions of patient safety culture highlighted throughout the intervention:
  - Patient-centered care
  - Error reporting
  - Non-punitive responses to error
  - Learning from errors
  - Patient safety training
  - Teamwork
DATA ANALYSIS

- Instrument reliability testing
  - Cronbach’s alpha (pre- and posttest)
  - Pearson product-moment correlation of pre- and posttest scores (test-retest method)

- Descriptive statistics
  - Group means with standard deviations
  - Skewness of data

- Chi-square analysis of demographic data
DATA ANALYSIS (CONT.)

- ANCOVA/Assumptions
  - Levene’s test (variance of homogeneity)
  - Pearson-product correlation (linearity)
  - Homogeneity-of-regression slopes test (interaction effect)

- Alpha level 0.05

- 95% confidence level

- Non-directional (two-tailed) hypothesis
**RESULTS: DESCRIPTION OF SAMPLE**

- n=138; 63 intervention group & 75 control group

**Gender:**
- 84% female & 16% male

**Age:**
- 66.7% (21-30)
- 27% (31-40)
- 6.3% (41-50)

**Ethnicity:**
- 57.1% Caucasian
- 25.4% Asian-American
- 7.9% Hispanic
RESULTS:
INSTRUMENT RELIABILITY TESTING

- Cronbach’s alpha at pretest and posttest
  - Unacceptably low (<.60)
    - Error Inevitability (.386 & .316)
    - Disclosure Responsibility (.474 & .446)
    - Importance of Patient Safety in Curriculum (.447 & .562)

- Interscale Correlations: low

- Test-Retest Reliability: moderate
RESULTS: DESCRIPTIVE STATISTICS

- Overall mean attitude scores:
  - 109.53 = intervention; 105.32 = control

- Raw mean attitude scores were higher (more positive) in the intervention group for all scales except Team Functioning.

- Attitude scores were positive in both groups, as indicated by the negative skewness of the data.
RESULTS: ASSUMPTION TESTING FOR ANCOVA

- No violations of Homogeneity of Variance

- Violation of Homogeneity of Regression with Error Reporting Confidence

- Weak correlation between dependent variable and covariate for Team Functioning
RESULTS: ANCOVA

- Significant for **Patient Safety Training**,
  \[ F(1, 135) = 4.750, \ p = .031, \ \text{partial } \eta^2 = .034 \]

- Not significant for **Error Reporting Confidence**,  
  \[ F(1, 135) = 2.445, \ p = .120, \ \text{partial } \eta^2 = .018 \]

- Not significant for **Working Hours as Error Cause**,  
  \[ F(1, 135) = 1.077, \ p = .301, \ \text{partial } \eta^2 = .008 \]
RESULTS: ANCOVA

- Significant for Error Inevitability, $F(1, 135) = 8.447$, $p = .004$, partial $\eta^2 = .059$

- Significant for Professional Incompetence as Error Cause, $F(1, 135) = 8.728$, $p = .004$, partial $\eta^2 = .061$

- Not significant for Disclosure Responsibility, $F(1, 135) = 2.108$, $p = .149$, partial $\eta^2 = .015$
RESULTS: ANCOVA

- Not significant for Team Functioning, $F(1, 135) = .040$, $p = .841$, partial $\eta^2 = .000$

- Significant for Patient’s Role in Error, $F(1, 135) = 8.011$, $p = .005$, partial $\eta^2 = .056$

- Significant for Importance of Patient Safety in Curriculum, $F(1,133) = 4.085$, $p = .030$, partial $\eta^2 = .035$
DISCUSSION

- The APSQ III demonstrated multidimensionality & unacceptable reliability for three scales.

- Improved attitudes might have resulted from participants in the intervention group applying what they learned in the educational session to the care of patients.
DISCUSSION

- Working hours might have been more resistant to the intervention as students have yet to experience fatigue as a nurse.

- Error disclosure and error reporting might have been more resistant to the intervention because of a “hidden curriculum” (Madigosky et al., 2006) and/or lack of a just culture.
LIMITATIONS

- Threats to internal validity
  - History

- Threats to external validity
  - Non-probability sample
  - Small sample size relative to the target population
  - Volunteer subjects
LIMITATIONS

- Threat to construct validity
  - Lack of theoretical understanding & consistent definition of patient safety culture

- Threat to conclusion validity
  - Multidimensionality of the APSQ III
  - Lack of inter-item reliability for 3 scales of the APSQ III
IMPLICATIONS

- Theoretical/Nursing Research/Nursing Education

  - The reciprocal interactive theory of patient safety culture in nursing can serve as the basis of teaching strategies that foster a culture of patient safety among nursing students.

  - The modified Eindhoven model can enhance student understanding of the role of nurses in medical error recovery.
IMPLICATIONS

- Theoretical/Nursing Research/Nursing Education
  - An instructional session of short duration can positively impact the attitudes toward patient safety of nursing students.
  - With refinement, the APSQ III can be used to measure the patient safety attitudes of nursing students at baseline and before and after an educational intervention.
IMPLICATIONS

Theoretical/Nursing Research/Nursing Education

- Greater curricula attention is needed on:
  - Fatigue-related medical errors
  - Disclosure of medical errors

- In order to promote error reporting and disclosure by students, nursing faculty and administrators must adopt a just culture in regard to medical errors.
RECOMMENDATIONS FOR FUTURE RESEARCH

- Refinement and testing of the APSQ III
- Study replication – BSN/ AD/new grads
- Explore the relationships between empowerment, medical error recovery, and patient safety culture.
Thank you!

Questions?