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National Council of State Boards of Nursing

NCSBN's National Simulation Study

Nancy Spector, PhD, RN, FAAN, Director, Regulatory Innovations
June 8, 2015, MT CAHN Education/Practice Summit Collaboration





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NCSBN's Mission

The National Council of State Boards of Nursing (NCSBN) provides education, service and research through collaborative leadership to promote evidence-based regulatory excellence for patient safety and public protection.

NCSBN's Simulation Study Team



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NATIONAL
SIMULATION
STUDY

- Jennifer Hayden, MSN, RN; PI
- Richard Smiley, MS, MA;
- Maryann Alexander, PhD, RN, FAAN;
- Suzan Kardong-Edgren, PhD, RN, ANEF, CHSE;
- Pamela Jeffries, PhD, RN, FAAN, ANEF

Review of Literature

- Small sample size
- No control group
- No randomization
- Variability in study design
- No longitudinal studies



Aims

- Can simulation be effectively substituted in the undergraduate prelicensure curriculum?
- How much?
- What courses?
- Generalizable results
- Provide data for boards of nursing



Research Questions-Part I

1. Does substituting clinical hours with 25% and 50% simulation impact educational outcomes (knowledge, clinical competency, critical thinking and readiness for practice) assessed at the end of the undergraduate nursing program?

Research Questions-Part I

2. Are there course by course differences in nursing knowledge, clinical competency, and perception of learning needs being met among undergraduate students when traditional clinical hours are substituted with 25% and 50% simulation?

Research Questions-Part I

3. Are there differences in first-time NCLEX pass rates between students that were randomized into a control group, 25% and 50% of traditional clinical substituted with simulation?

Research Questions-Part II

1. Are there differences in clinical competency, critical thinking and readiness for practice among the new graduate nurses from the three study groups?
2. Are there differences among new graduates from the three study groups in acclimation to the role of the professional nurse?

Research Design

- Randomized
- Controlled
- Large-scale
- Multi-site
- Longitudinal



Inclusion Criteria: Nursing Education Programs

- BON-approved program
- ADN or BSN
- National accreditation
- NCLEX pass rates at or above the national average pass rate
- Sim lab

Inclusion/Exclusion Criteria: Students

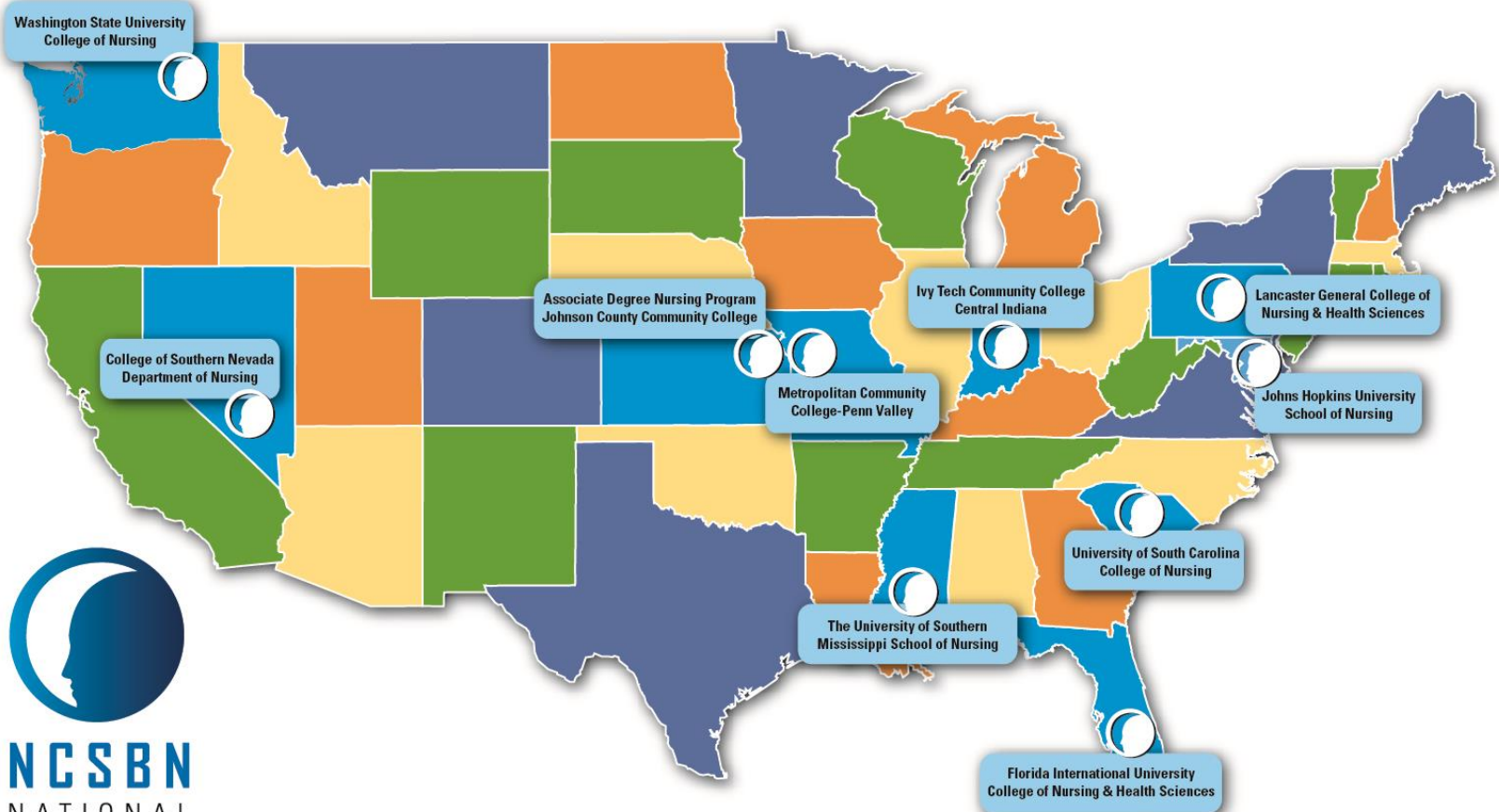
Inclusion (continued):

- Enrolled Fall 2011; Graduation Spring 2013

Exclusion:

- Accelerated BSN students
- Degree completion
- Any student holding a nursing license

The National Simulation Study Participating Sites



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Fall 2011: Study Groups

Control Group

- Traditional clinical experiences
Up to 10% simulation

25% Group

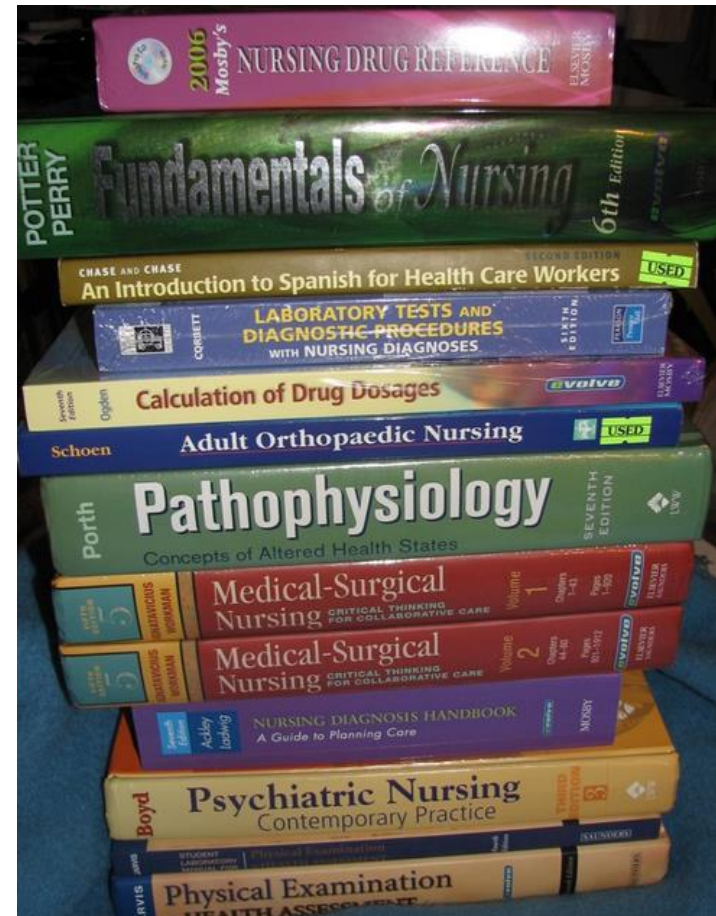
- 25% of clinical time spent in simulation
- 75% traditional clinical experience

50% Group

- 50% of clinical time spent in simulation
- 50% of time in traditional clinical experience

Core Courses

- Fundamentals of Nursing
- Medical-Surgical Nursing
- Advanced
 Medical-Surgical Nursing
- Maternal-newborn Nursing
- Pediatrics
- Mental Health Nursing
- Community Health Nursing





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DATA COLLECTION

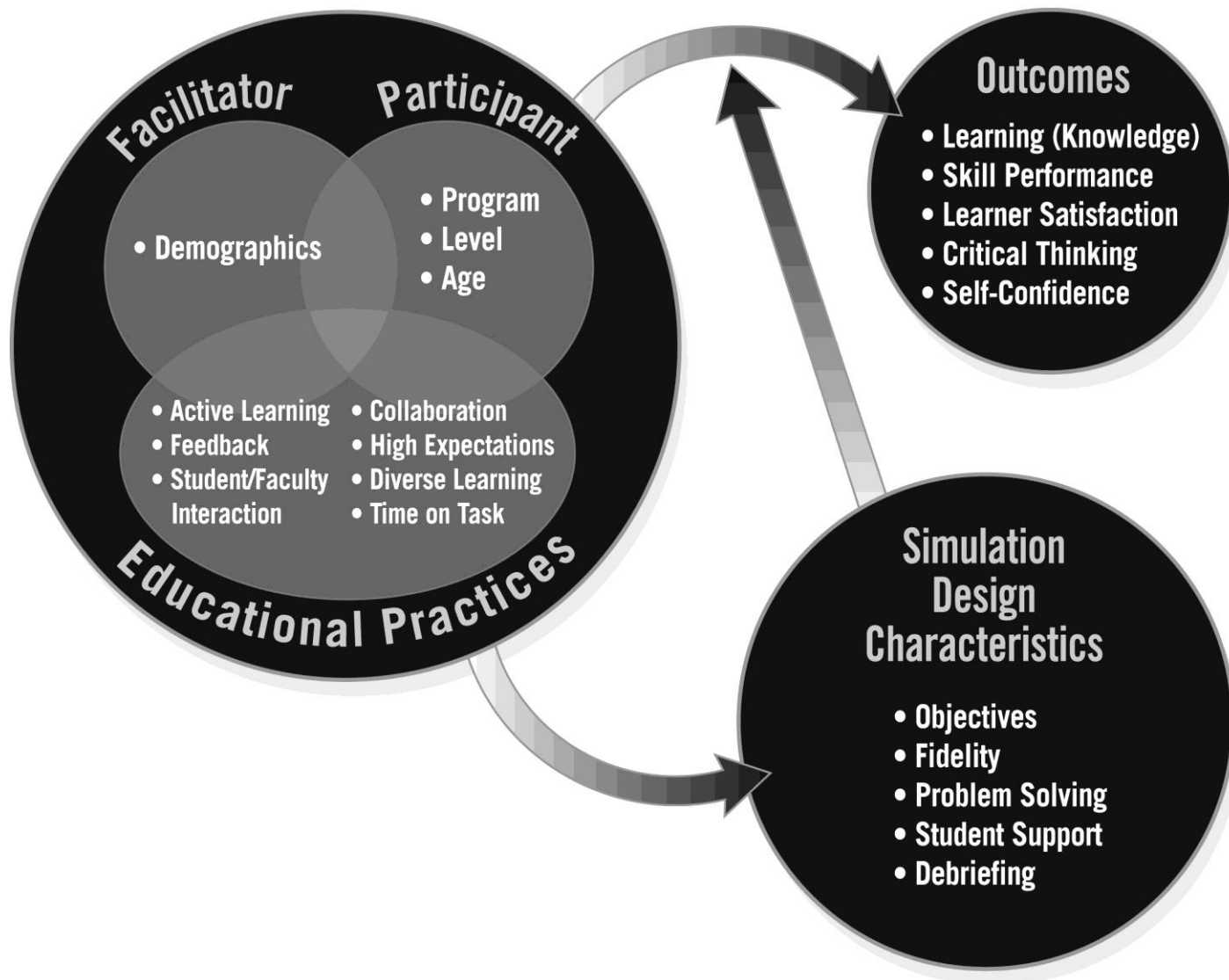
Instruments

- Nursing knowledge
ATI Content Mastery Series®
- Clinical competency
Creighton Competency Evaluation Instrument (CCEI)
New Graduate Nurse Performance Survey
- Global assessment of clinical competency & readiness for practice
- National Council Licensure Exam® (NCLEX)

Instruments

- Learning needs met
 - Clinical Learning Environment Comparison Survey (CLECS)
- Critical thinking
 - Critical Thinking Diagnostic
- Acclimation to the role of the RN
 - Left first nursing position, patient loads, charge nurse responsibilities, workplace stress

The NLN/Jeffries Simulation Framework



Simulations Used

- Scenario based simulation using high and medium fidelity manikins
- Standardized patients
- Role playing
- Computer-based critical thinking simulations
- Skills stations

A Typical Simulation day

- Entire clinical group reported to the sim lab with clinical instructor
- Students were assigned to two nursing roles
- Clinical instructor completed CCEI ratings

Standardized Curriculum









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RESULTS: SAMPLE DEMOGRAPHICS

Demographics

- Began study: N= 847
- Completed Study: N=666

	<u>Started study</u>	<u>Completed study</u>
Control	268	218
25% group	293	236
50% group	286	212

- Female: 86%
- White: 84%
- Age: 26.3 years (SD 8.0, range 18-60)
- Experience as nursing assistant: 16%

Attrition

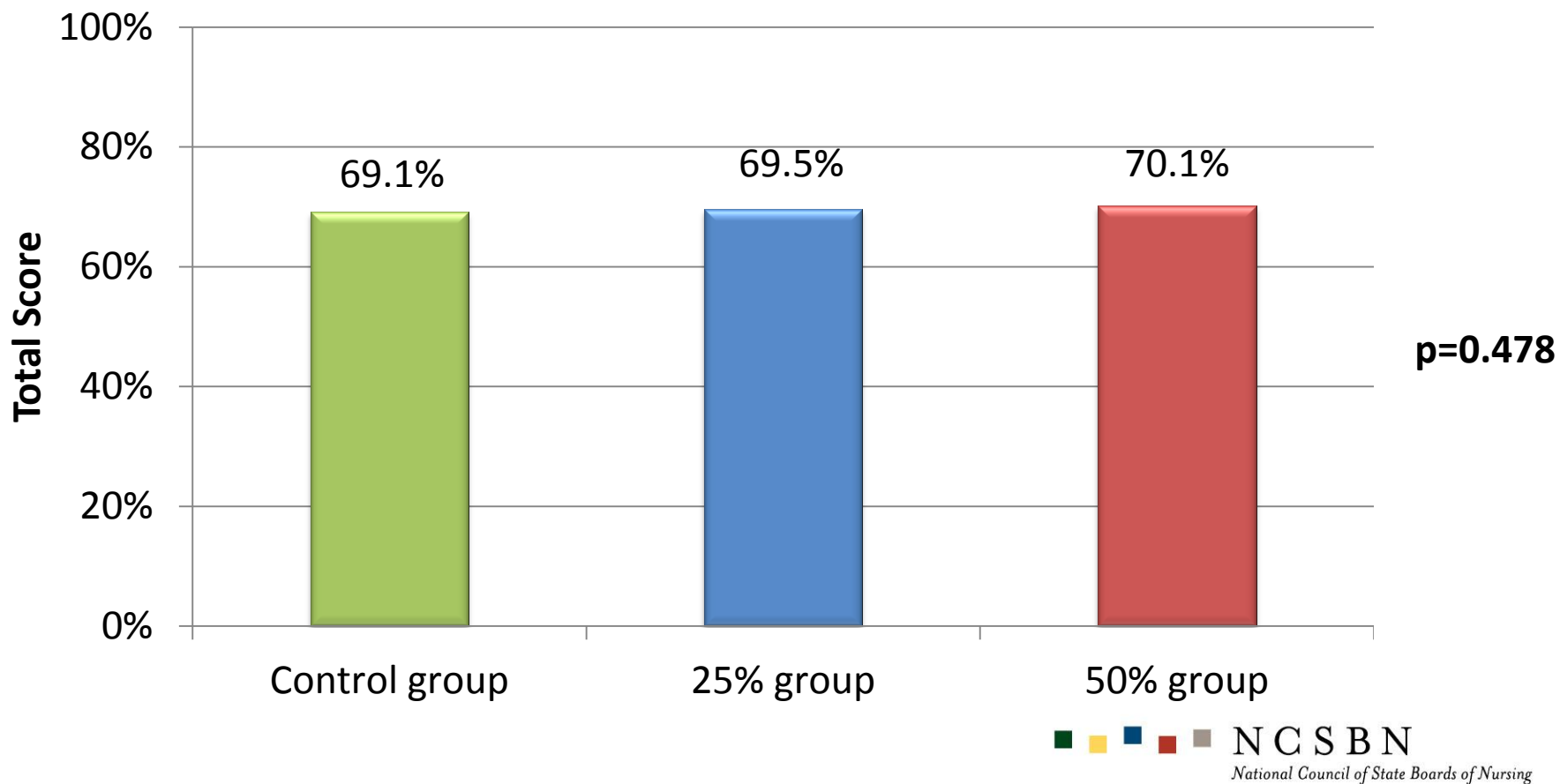
	Overall	Control group	25% group	50% group
Number of students randomized	847	268	293	286
Number of students completing the study	666	218	236	212
<i>Rate of Completion</i>	<i>78.6%</i>	<i>81.3%</i>	<i>80.5%</i>	<i>74.1%</i>
Number of students who failed a course during the study	66	25	22	19
<i>Rate of Failure</i>	<i>7.8%</i>	<i>9.3%</i>	<i>7.5%</i>	<i>6.6%</i>
Number of students who withdrew or were withdrawn from the study for any reason	115	25	35	55
<i>Rate of Withdrawal</i>	<i>13.6%</i>	<i>9.3%</i>	<i>11.9%</i>	<i>19.2%**</i>

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Research Question 1

Does substituting clinical hours with 25% and 50% simulation impact educational outcomes (knowledge, clinical competency, critical thinking and readiness for practice) assessed at the end of the undergraduate nursing program?

Knowledge: Mean Scores-End of Program ATI Comprehensive Predictor



Clinical Competency: End of Program Preceptor Ratings

New Graduate Nurse Performance Survey (1-6 scale) 1=Lowest; 6=Highest

	Control group (n=155)		25% group (n=171)		50% group (n=136)		Effect size	P value
	Mean	SD	Mean	SD	Mean	SD		
Clinical Knowledge	5.12	0.73	5.18	0.60	5.09	0.72	0.14	0.481
Technical Skills	5.06	0.76	5.09	0.64	5.01	0.86	0.11	0.659
Critical Thinking	5.11	0.72	5.06	0.71	5.03	0.88	0.10	0.668
Communication	5.30	0.65	5.34	0.65	5.24	0.87	0.13	0.478
Professionalism	5.38	0.69	5.47	0.61	5.39	0.85	0.14	0.432
Management of Responsibilities	5.22	0.71	5.20	0.70	5.17	0.85	0.06	0.849

Critical Thinking: End of Program Preceptor Ratings

Critical Thinking Diagnostic (1-6 scale) 1=Lowest; 6=Highest

	Control group (n=155)		25% group (n=171)		50% group (n=136)		Effect size	P value
	Mean	SD	Mean	SD	Mean	SD		
Problem Recognition	4.97	0.70	5.07	0.65	5.02	0.75	0.15	0.494
Clinical Decision Making	5.09	0.60	5.18	0.61	5.12	0.81	0.15	0.469
Prioritization	5.14	0.66	5.08	0.63	5.03	0.77	0.15	0.418
Clinical Implementation	5.10	0.61	5.19	0.60	5.10	0.76	0.15	0.361
Reflection	5.13	0.64	5.23	0.59	5.15	0.78	0.16	0.318

Overall Clinical Competency: End of Program Preceptor Ratings

Global assessment of clinical competency & readiness for practice (1-10 scale) 1=Lowest; 10=Highest

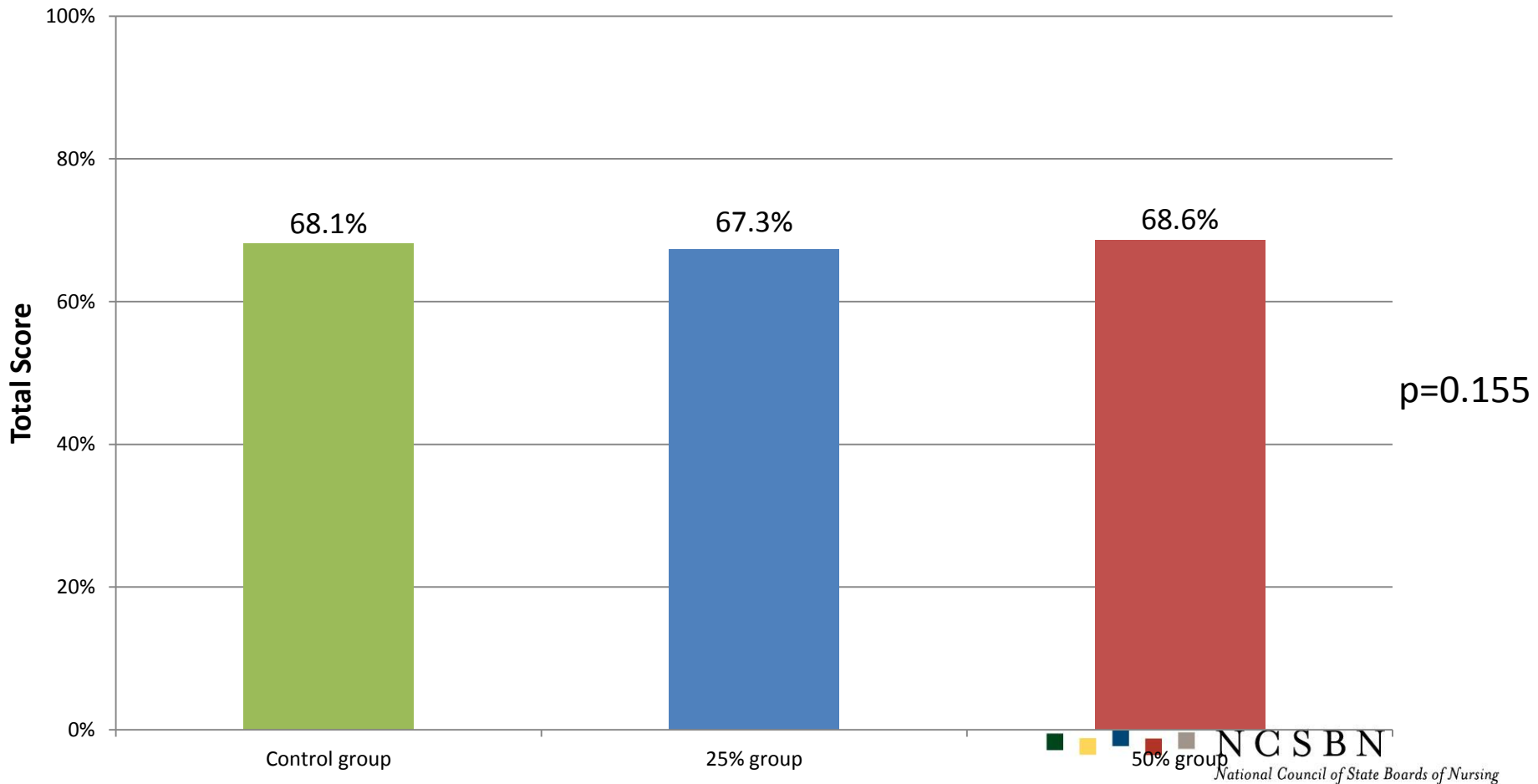
	Control group (n=156)		25% group (n=168)		50% group (n=135)		Effect size	P value
	Mean	SD	Mean	SD	Mean	SD		
Overall rating	8.20	1.34	8.29	1.48	8.34	1.44	0.10	0.688

Research Question 2

Are there course by course differences in nursing knowledge, clinical competency, and perception of learning needs being met among undergraduate students when traditional clinical hours are substituted with 25% and 50% simulation?

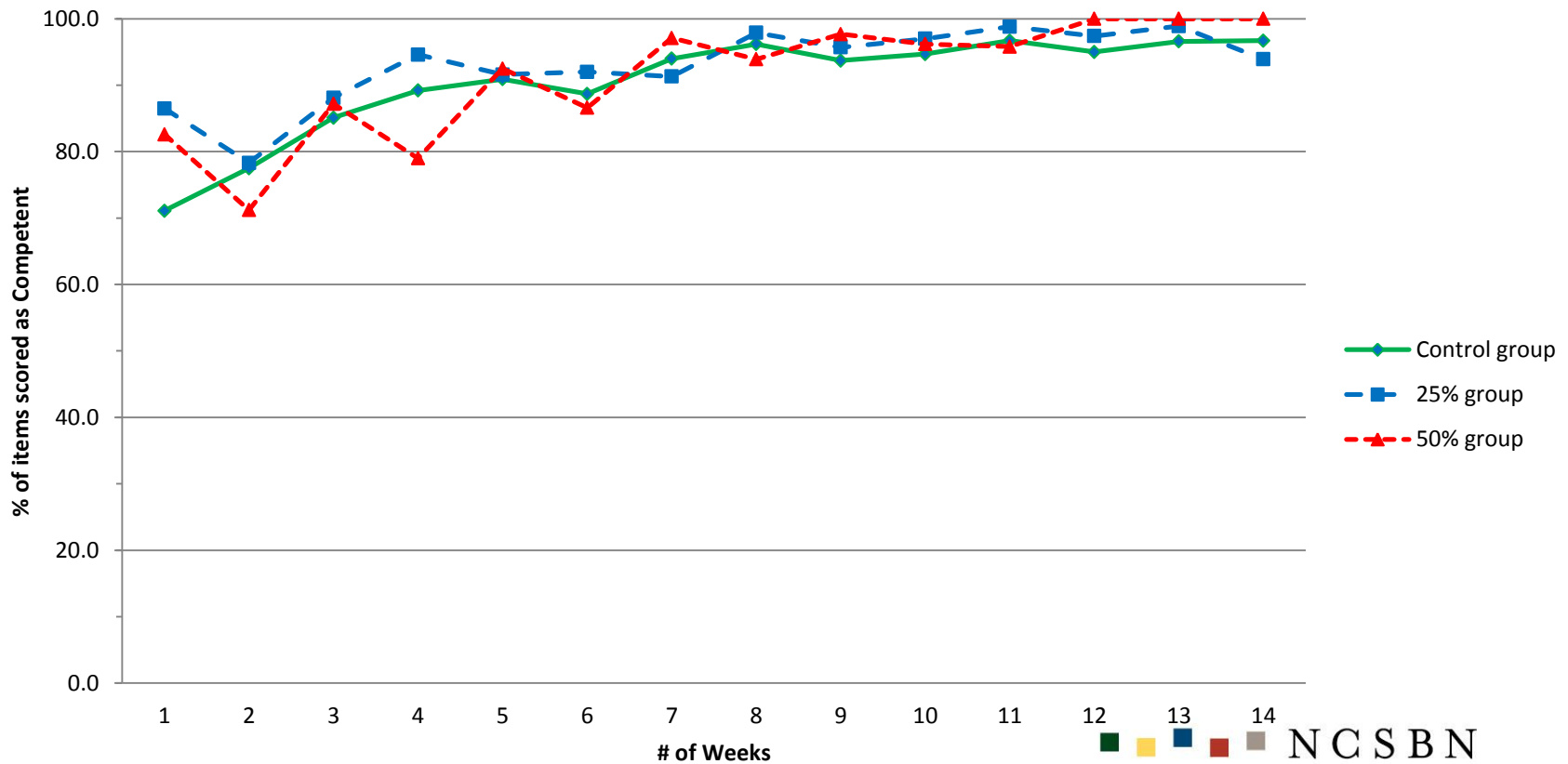
Fundamentals of Nursing: Knowledge Assessment

ATI Assessment Total Score (n=800)



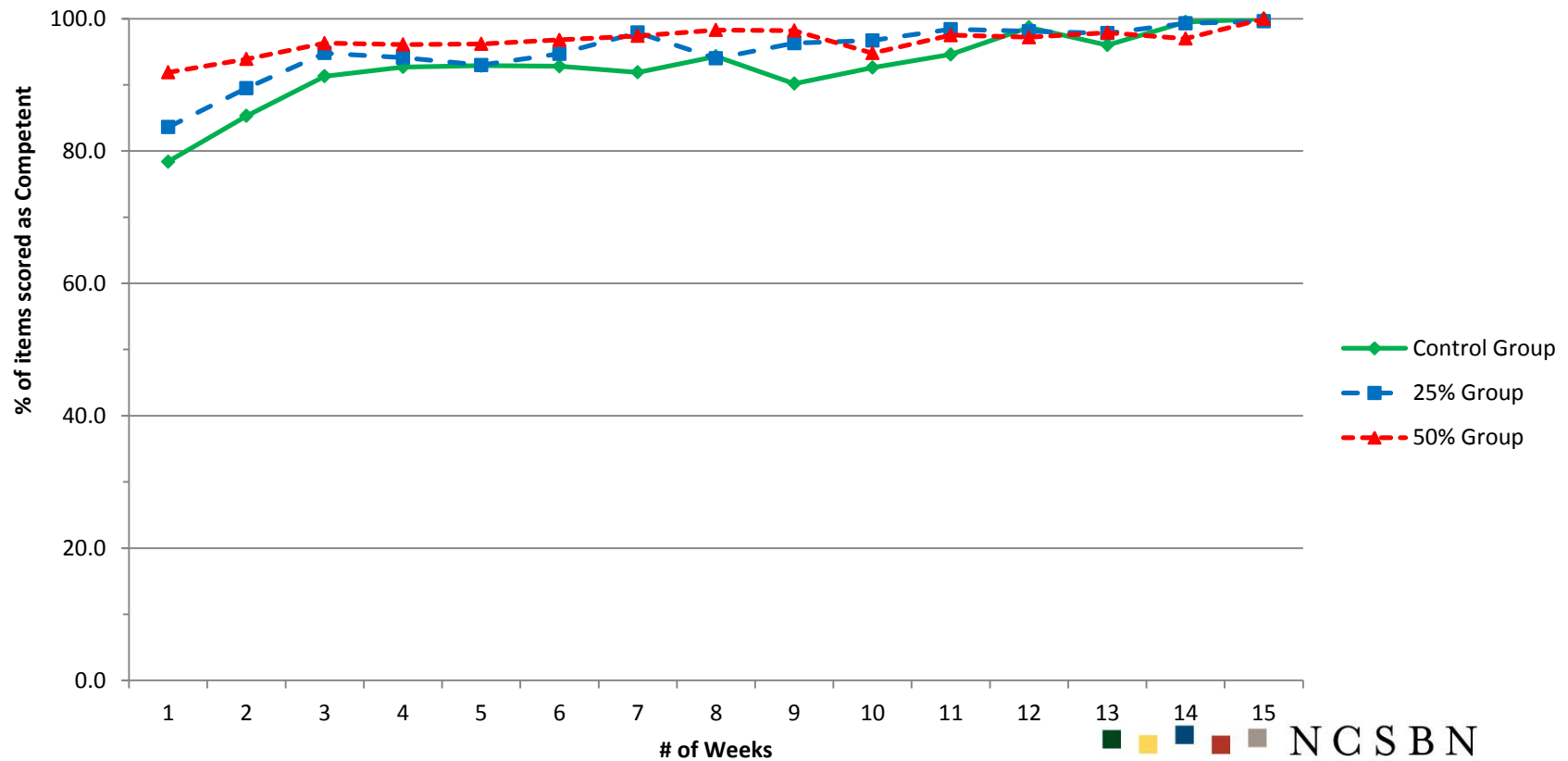
Fundamentals of Nursing: Clinical Competency

CCEI Scores: Clinical Setting



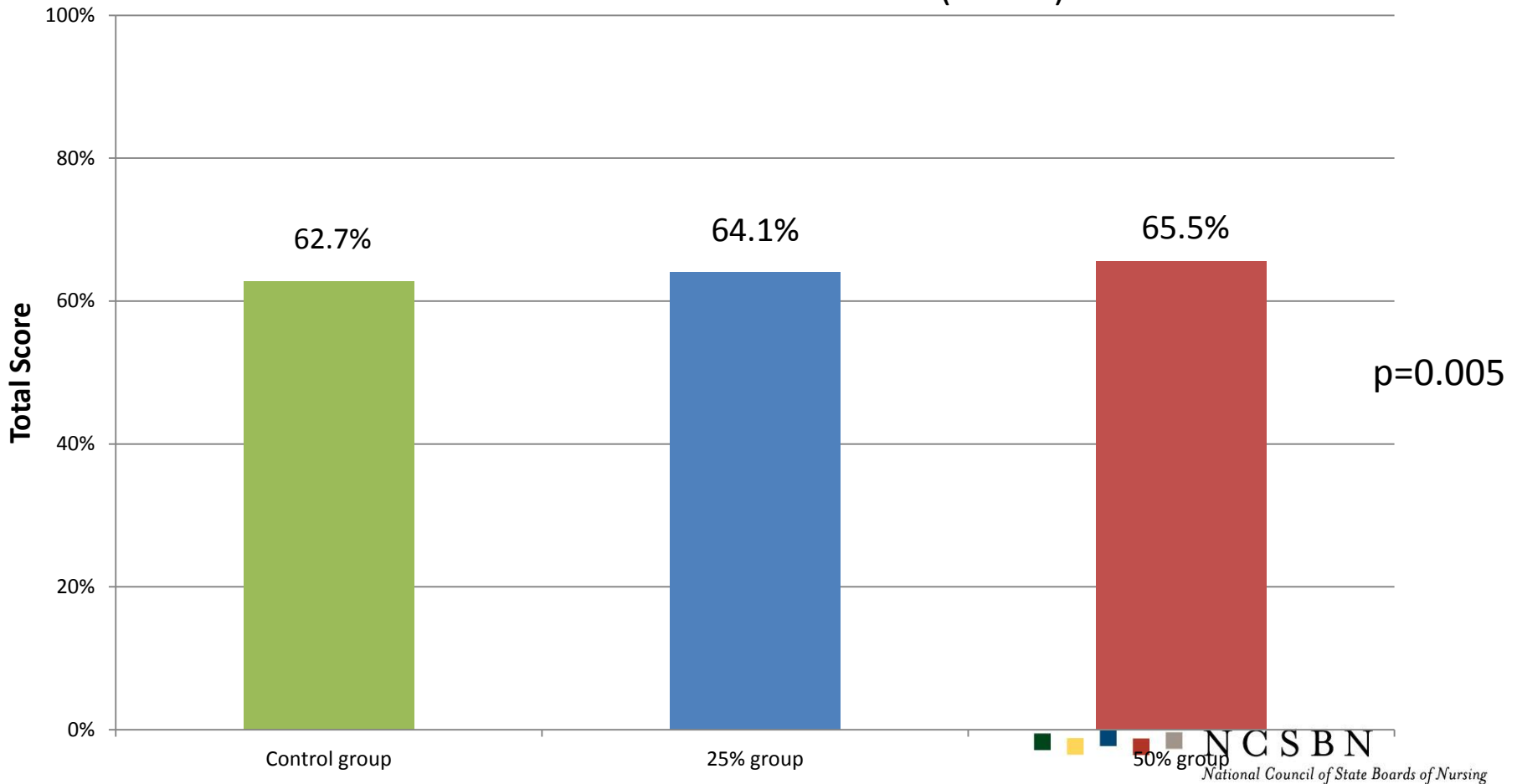
Medical-Surgical Nursing: Clinical Competency

CCEI Scores: Clinical Environment

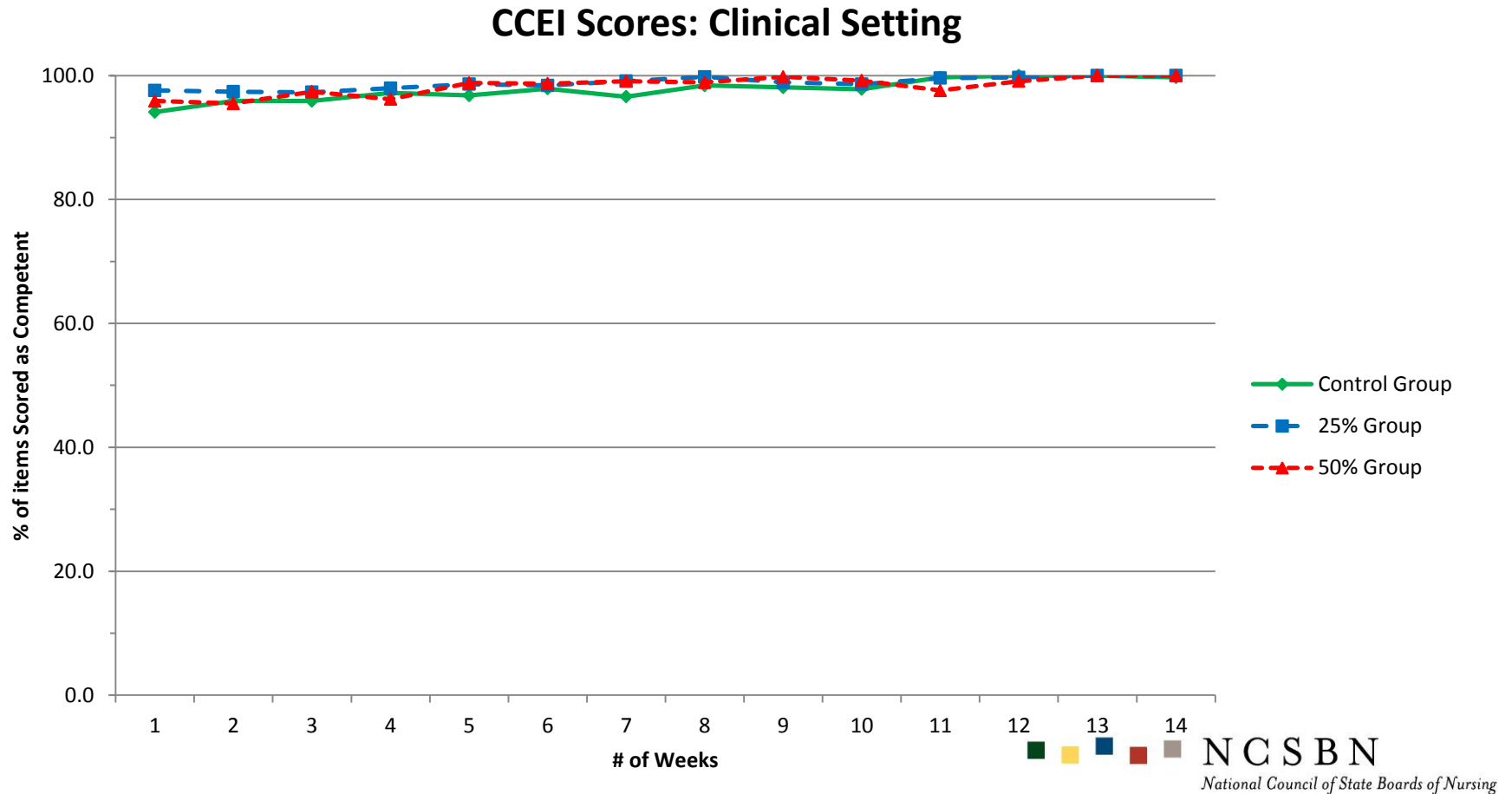


Advanced Medical-Surgical Nursing: Knowledge Assessment

ATI Assessment Total Score (n=683)

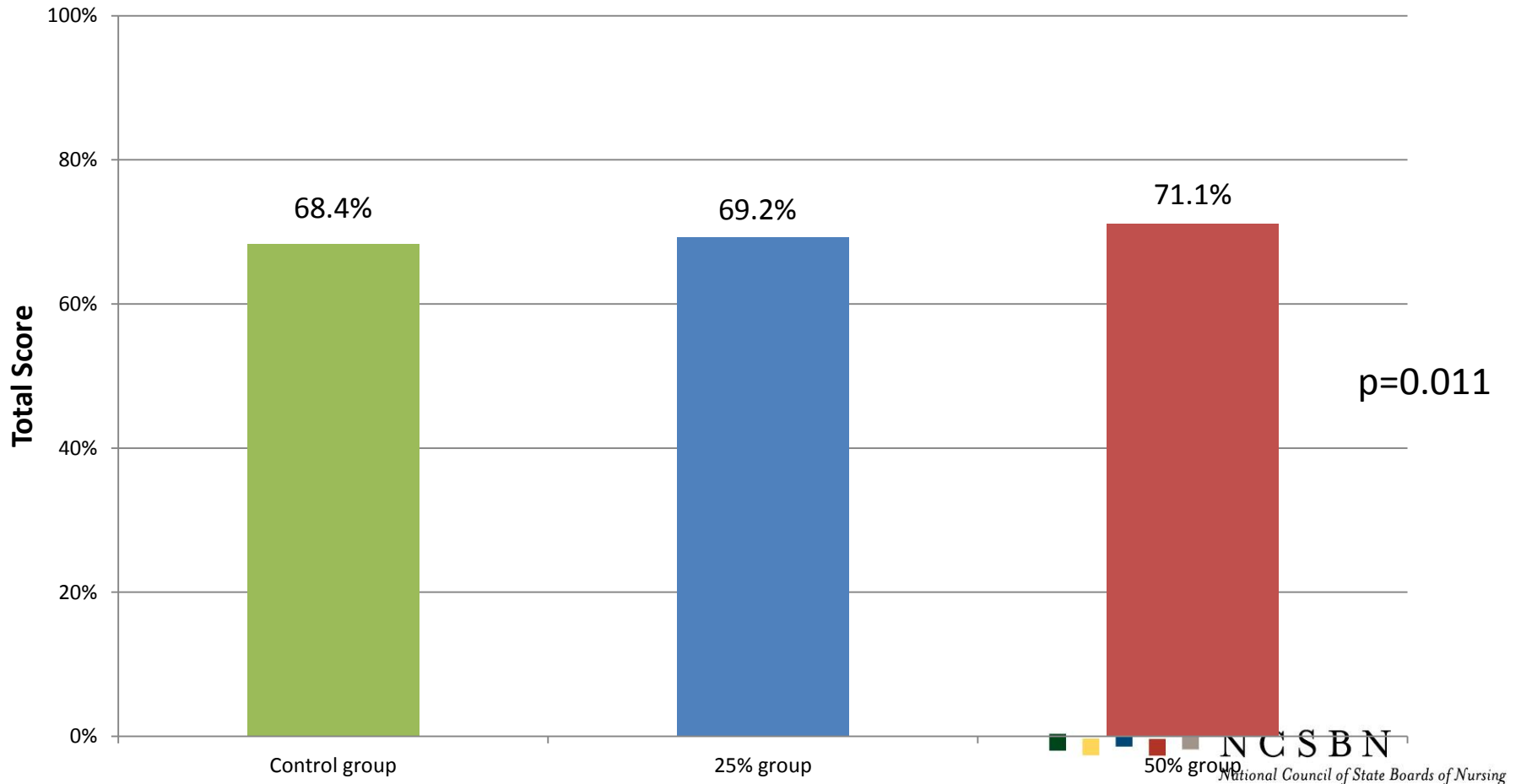


Advanced Medical-Surgical Nursing: Clinical Competency

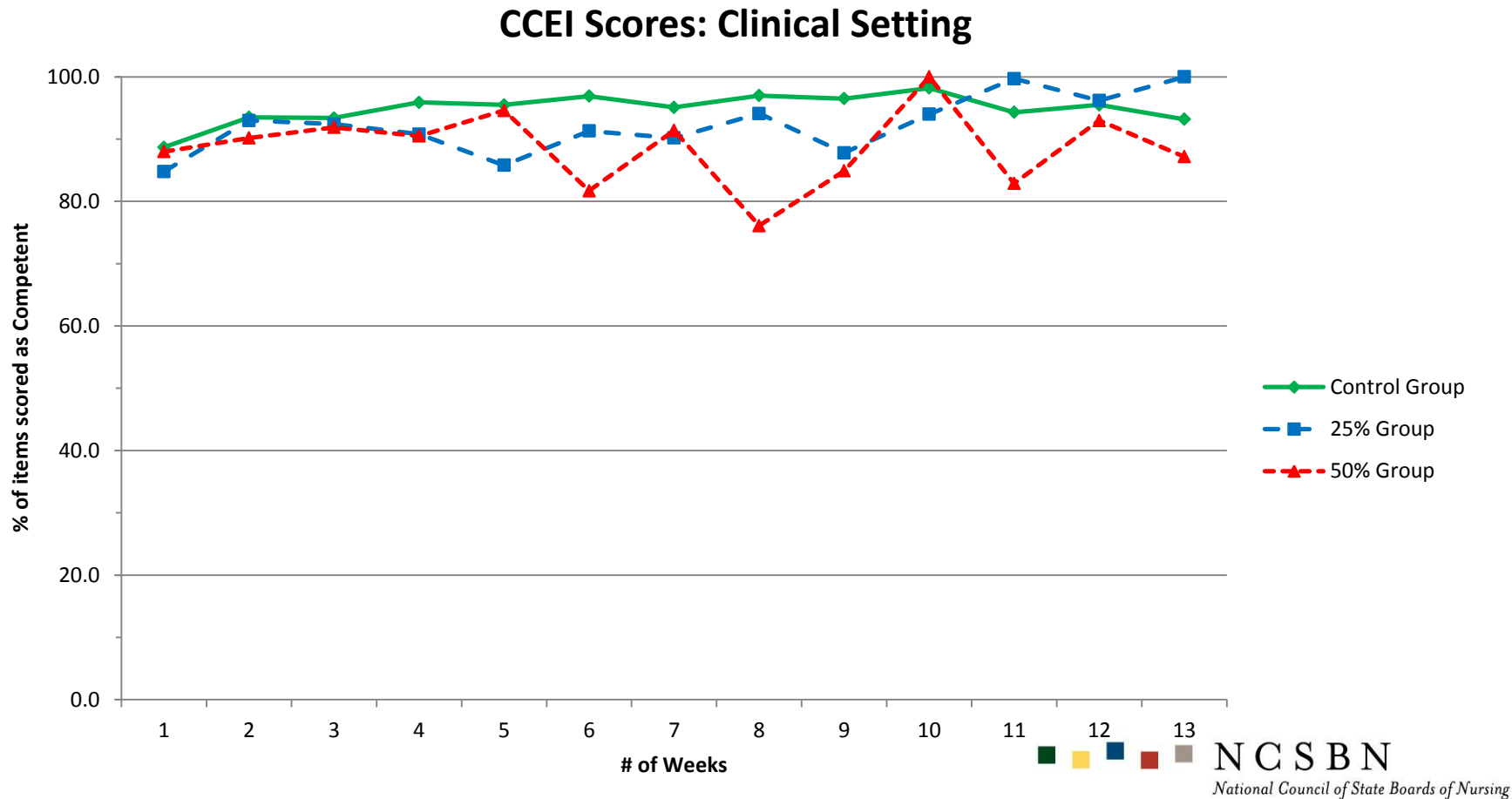


Maternal-Newborn Nursing: Knowledge Assessment

ATI Assessment Total Score (n=680)

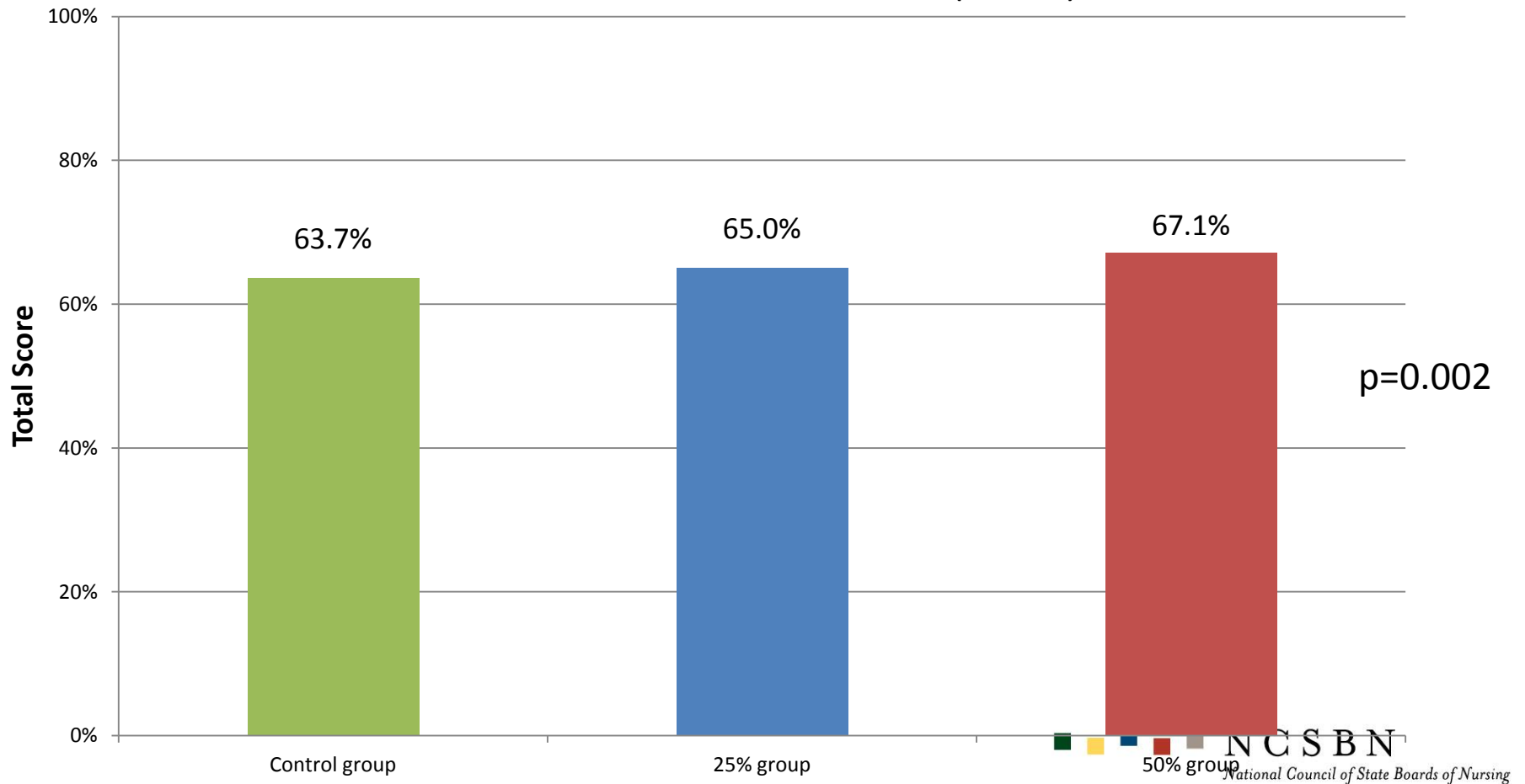


Maternal-Newborn Nursing: Clinical Competency

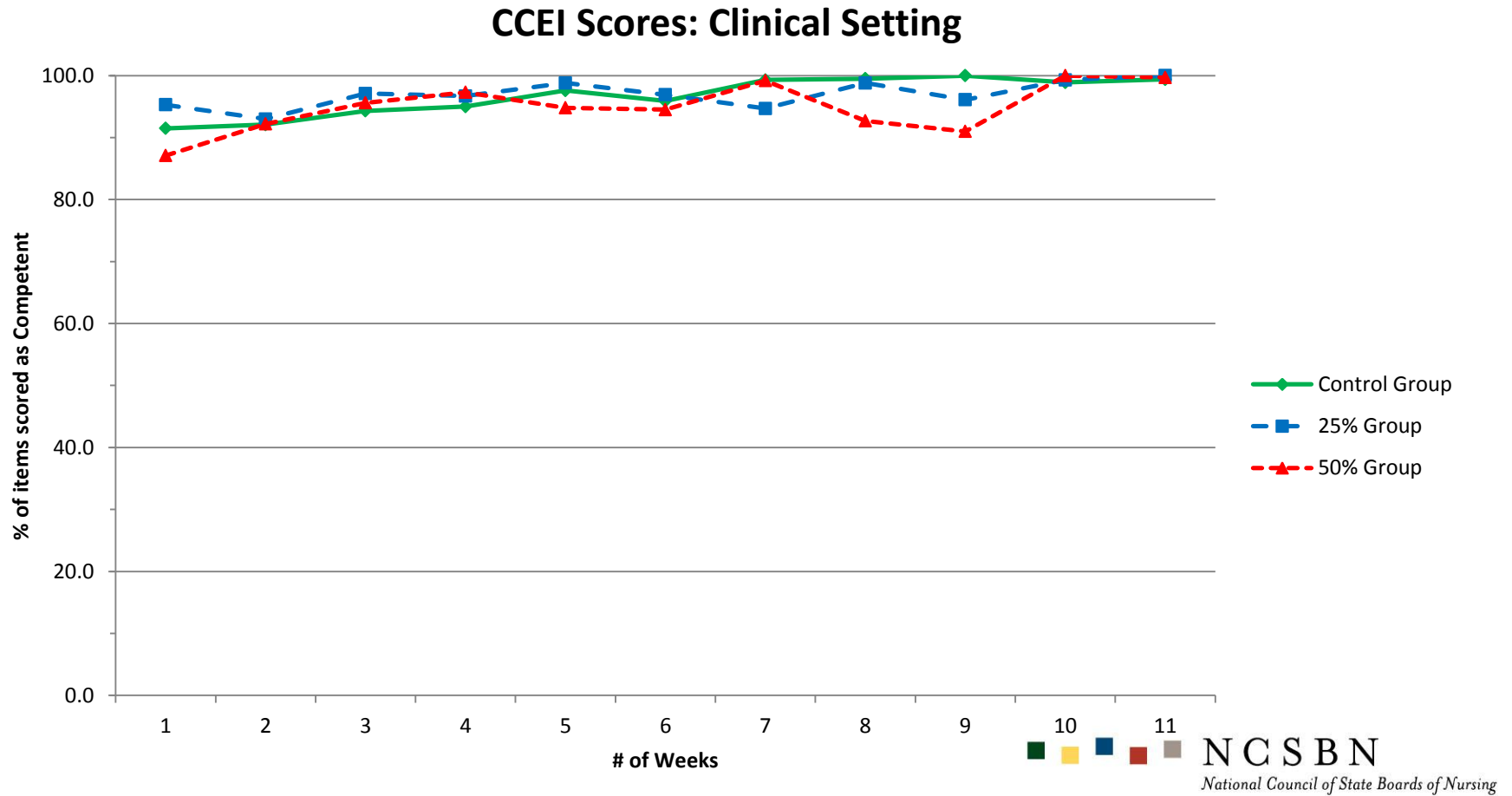


Pediatric Nursing Knowledge Assessment

ATI Assessment Total Score (n=620)

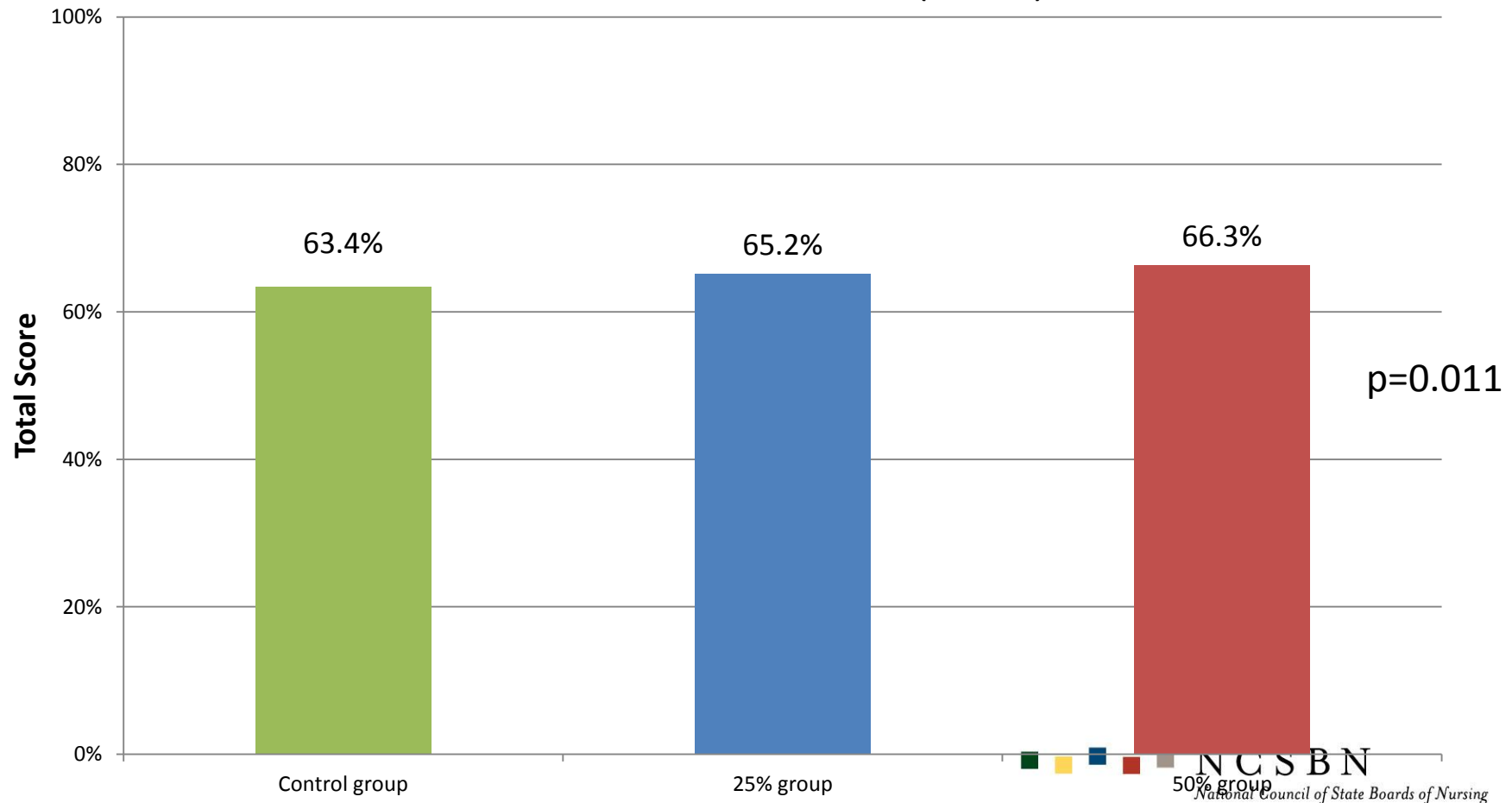


Pediatric Nursing: Clinical Competency

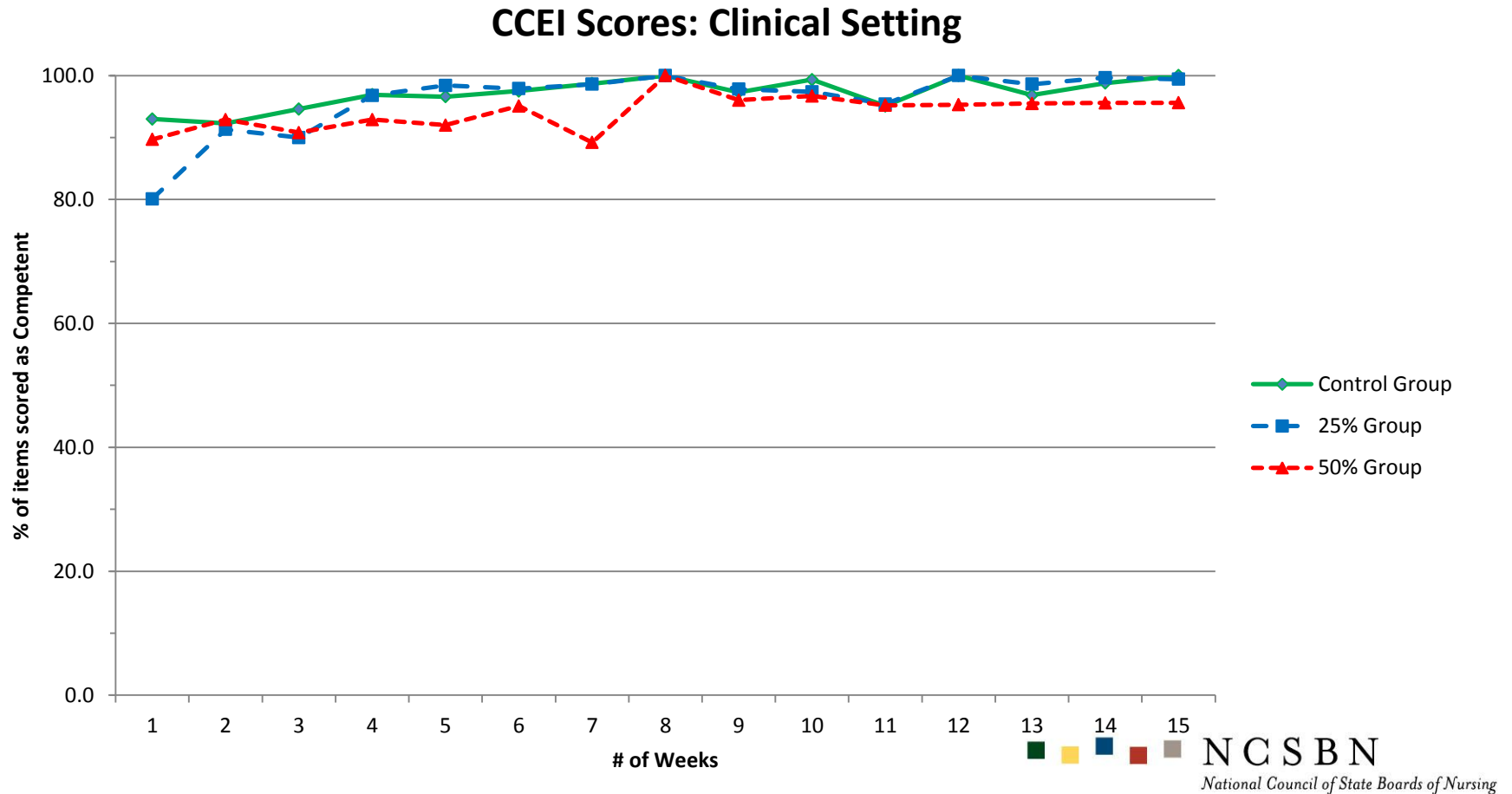


Mental Health Nursing: Knowledge Assessment

ATI Assessment Total Score (n=633)

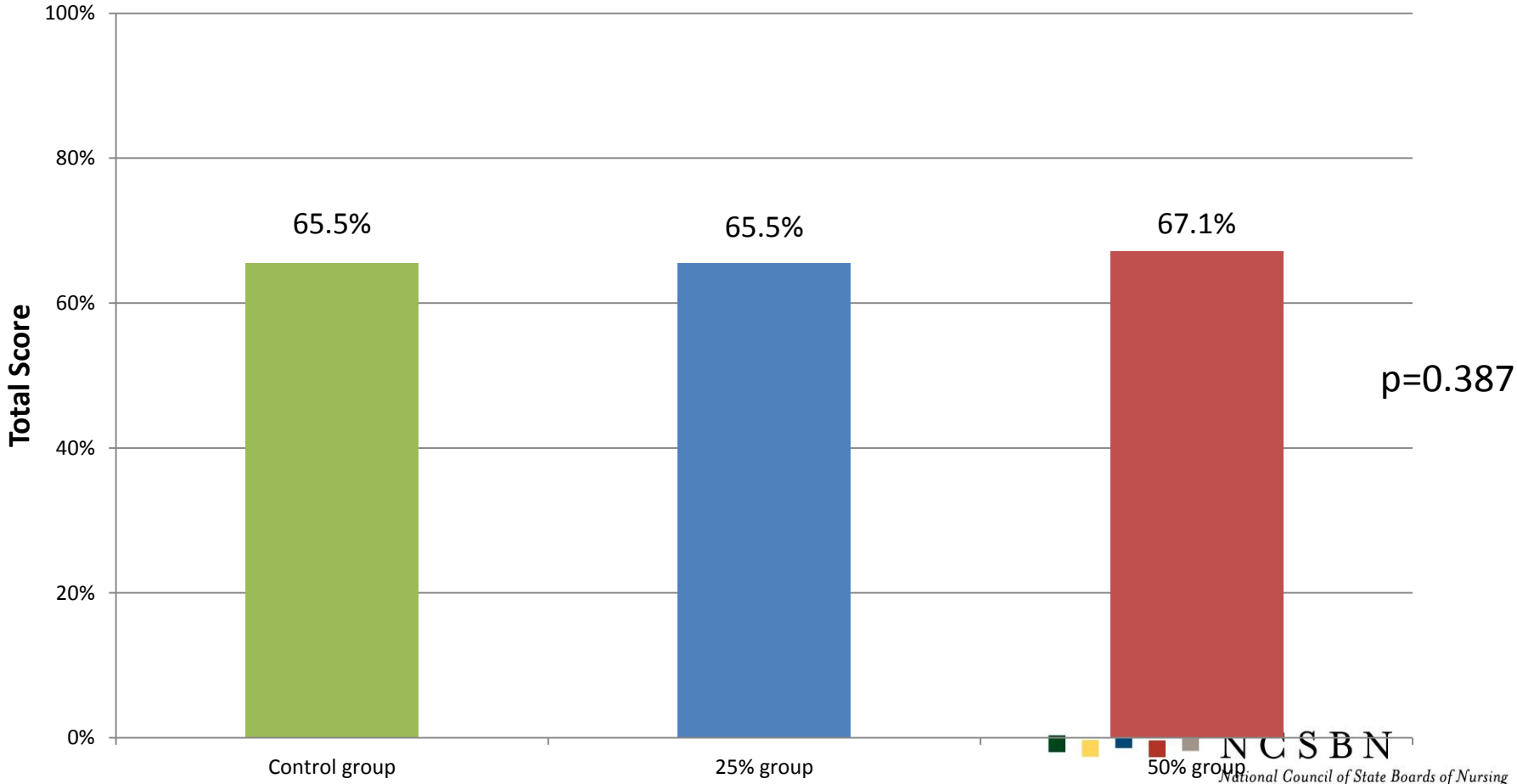


Mental Health Nursing: Clinical Competency

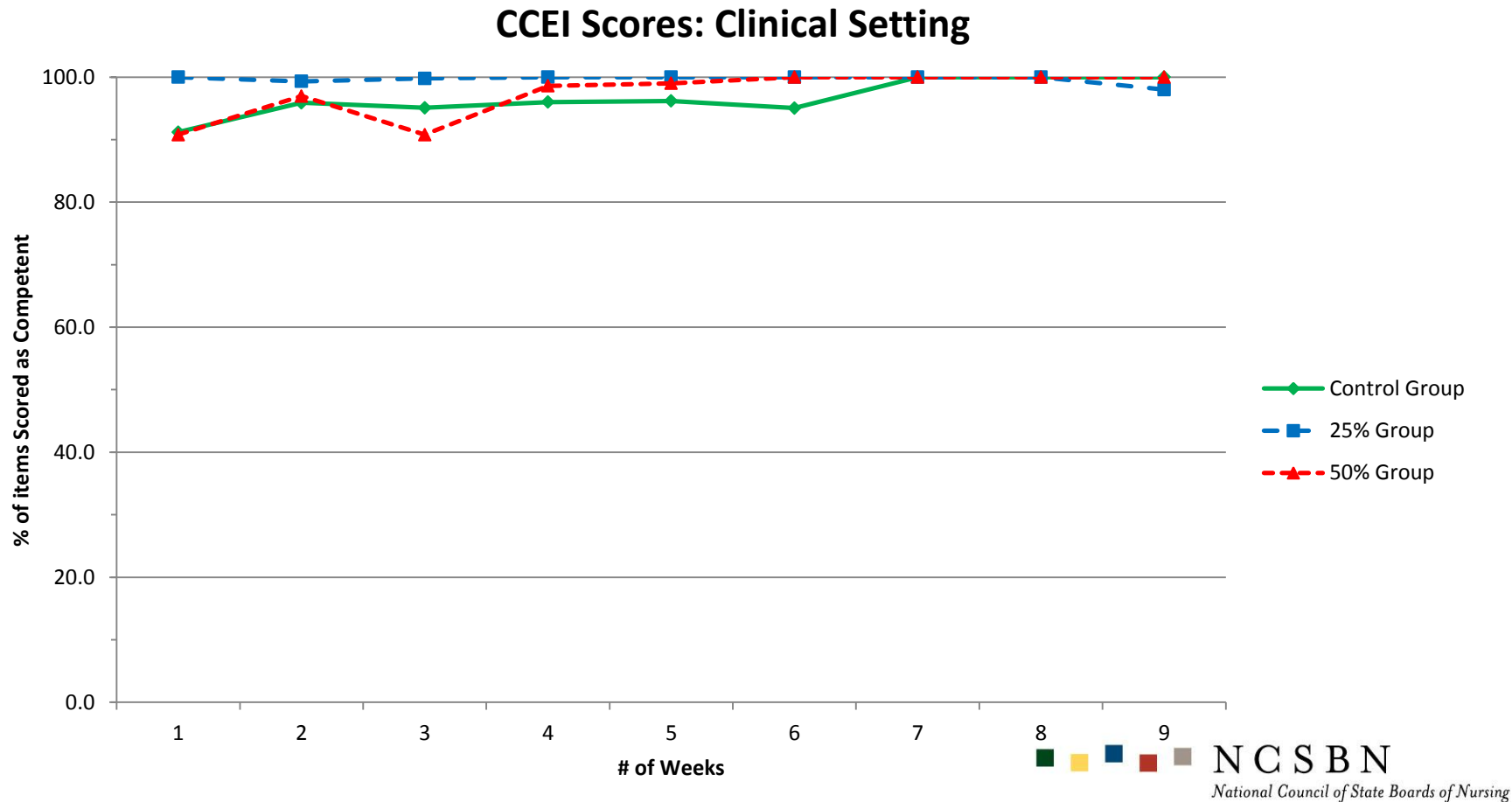


Community Health Nursing Knowledge Assessment

ATI Assessment Total Score (n=252)



Community Health Nursing: Clinical Competency



Learning Needs Met-End of Program Clinical Environment Comparison Survey (CLECS)

	Control group				25% group				50% group			
	n	Mean	SD	Effect Size	n	Mean	SD	Effect Size	n	Mean	SD	Effect Size
Traditional	197	3.50	0.42	1.23	202	3.41	0.41	0.28	187	3.26	0.53	0.57
Simulation	174	2.82	0.67		202	3.28	0.51		187	3.54	0.45	

Scale 1-4

1=Learning needs not met

4=Learning needs well met

Research Question 3

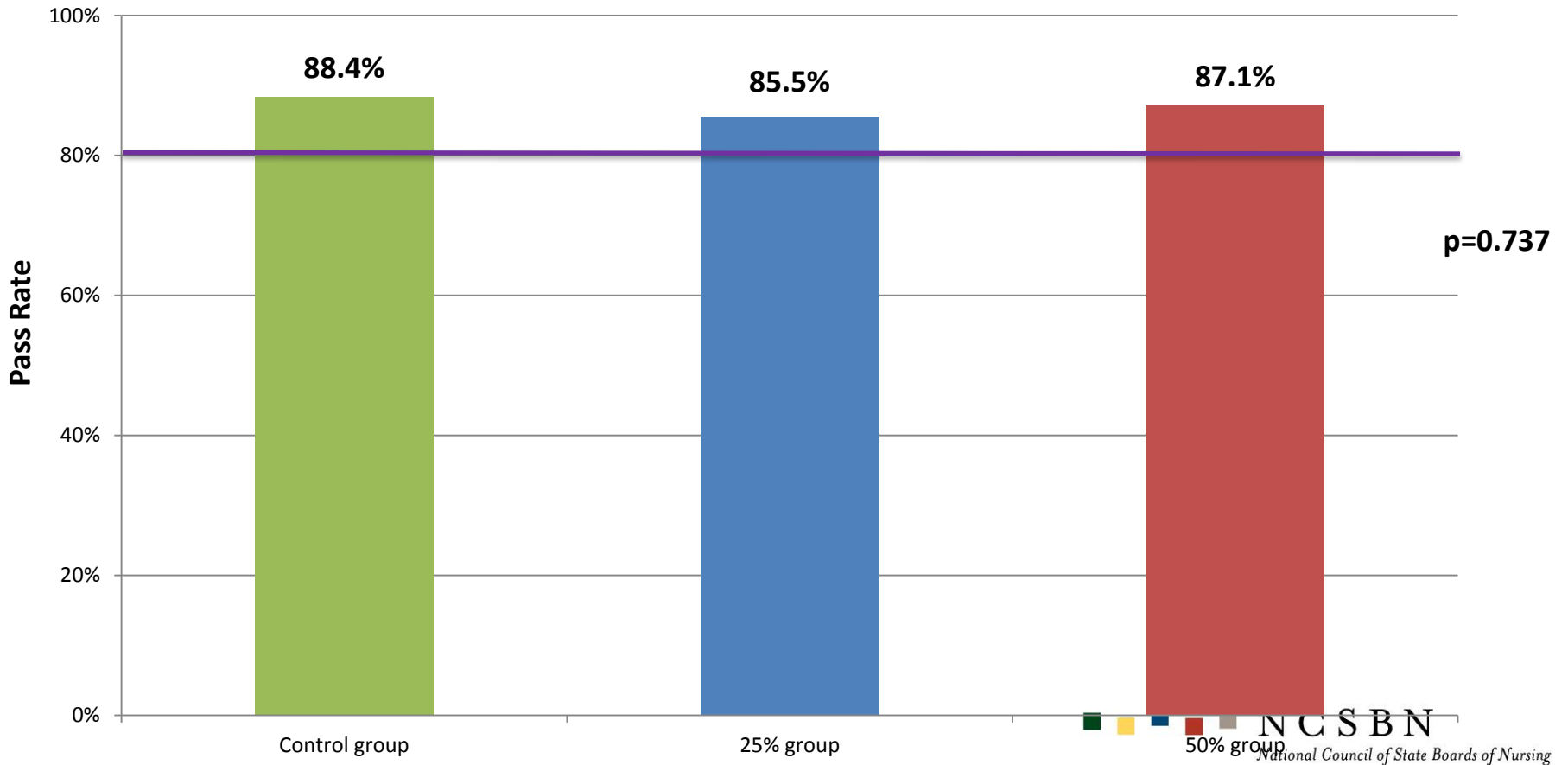
Are there differences in first-time NCLEX pass rates between students that were randomized into a control group, 25% and 50% of traditional clinical substituted with simulation?



NCLEX

May-December 2013

NCLEX First Time Pass Rates





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PART II: FOLLOW UP STUDY

Follow-up Questionnaires

6 weeks

3 months

6 months

 **New Graduate Six Week Survey**

This is the first survey for the NCSBN National Simulation Study: Longitudinal Follow-up. The purpose of this survey is to determine how well you were prepared for clinical practice as a new graduate nurse. Please answer all questions and then return your survey in the postage-paid envelope provided.

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Section 1: Demographic Questions

1. When did you become licensed as a registered nurse? ____/____/____ (mm/yy)

2. Which of the following best describes the location of your employment setting?

- Urban/metropolitan
- Suburban
- Rural

3a. Which of the following best describes the type of institution in which you work?

- Hospital/Medical center
- Long-term care facility
- Community-based or ambulatory setting (e.g., physician office, public health clinic, home health, school, prison, etc.)
- Other, please describe: _____

3b. If you work in a hospital or medical center, does the facility currently have Magnet designation?

- Yes Unsure
- No Not applicable

4. Which of the following best describes the type of patient care environment in which you work? (Select one)

- Critical care (ICU, CCU, step-down units, emergency department)
- Medical-Surgical unit Specialty: _____
- Pediatrics or nursery
- Labor & delivery or postpartum
- Psychiatry
- Operating room or post-anesthesia care unit
- Long-term care facility (nursing home, rehab, residential care)
- Ambulatory/Outpatient care (physician's office)
- Home health/Home hospice
- Other, please specify: _____

5. What is your job title? _____

6. Are you working in the job of your first choice? Yes No

7. On average, how many hours do you work in a typical week? _____ hours

8. On average, how many hours do you work in a typical shift? _____ hours

Which of the following best describes your current work schedule? (Select one)

- Day (7am-3pm) Night (11pm-7am)
- Day (9am-5pm) Night (12-hour shift)
- Day (12-hour shift) Rotating
- Evening (3pm-11pm) Other: _____

10. Over the last week, what was the average number of patients each shift you were assigned to provide direct patient care? _____

Part II First 6 Months of Practice: Response Rate

- 575 students agreed to be contacted for follow-up surveys (86.3% of study completers)
- 379 new graduates provided their start date information (65.9% of those who agreed to follow-up study)
- 355 completed at least one follow-up survey

Part II

Research Question 1

Are there differences in clinical competency, critical thinking and readiness for practice among the new graduate nurses from the three study groups?

Clinical Competency – 6 Mos. Manager

New Graduate Nurse Performance Survey (1-6 scale) 1=Lowest;
6=Highest

	Control group (n=72)		25% group (n=86)		50% group (n=84)		Effect size	P value
	Mean	SD	Mean	SD	Mean	SD		
Clinical Knowledge	5.21	0.63	5.07	0.92	5.21	0.66	0.17	0.376
Technical Skills	5.28	0.65	5.09	0.95	5.19	0.65	0.23	0.325
Critical Thinking	5.11	0.78	5.06	0.92	5.15	0.72	0.11	0.741
Communication	5.40	0.66	5.22	0.95	5.42	0.70	0.24	0.203
Professionalism	5.54	0.58	5.30	0.95	5.50	0.65	0.30	0.096
Management of Responsibilities	5.26	0.73	5.13	0.94	5.32	0.73	0.23	0.284

Critical Thinking: 6 Month Manager Ratings

Critical Thinking Diagnostic (1-6 scale) 1=Lowest; 6=Highest

	Control group (n=72)		25% group (n=85)		50% group (n=84)		Effect size	P value
	Mean	SD	Mean	SD	Mean	SD		
Problem Recognition	5.36	0.60	5.17	0.88	5.28	0.57	0.25	0.251
Clinical Decision Making	5.40	0.53	5.28	0.88	5.36	0.53	0.16	0.491
Prioritization	5.36	0.68	5.25	0.90	5.35	0.57	0.14	0.559
Clinical Implementation	5.40	0.49	5.21	0.92	5.38	0.55	0.25	0.116
Reflection	5.42	0.53	5.26	0.92	5.39	0.58	0.21	0.325

Overall Clinical Competency: 6 Month Manager Ratings

**Global assessment of clinical competency & readiness for practice
(1-10 scale) 1=Lowest; 10=Highest**

	Control group (n=72)		25% group (n=86)		50% group (n=84)		Effect size	P value
	Mean	SD	Mean	SD	Mean	SD		
Overall rating	8.60	1.37	8.36	1.46	8.55	1.16	0.16	0.527

Part II

Research Question 2

Are there differences among new graduates from the three study groups in acclimation to the role of the professional nurse?

Preparation for Practice

6 Week Survey

	Control group (n=68)		25% group (n=99)		50% group (n=99)		Effect size	P value
	freq	%	freq	%	freq	%		
Very well prepared	15	22%	20	20%	36	36%	0.16	0.030**
Quite a bit prepared	25	37%	42	42%	36	36%		
Somewhat prepared	26	38%	37	37%	27	27%		
Not at all prepared	2	3%	0	0	0	0		

6 Month Survey

	Control group (n=98)		25% group (n=108)		50% group (n=109)		Effect size	P value
	freq	%	freq	%	freq	%		
Very well prepared	14	14%	21	19%	29	27%	0.11	0.261
Quite a bit prepared	44	45%	40	37%	46	42%		
Somewhat prepared	38	39%	46	43%	33	30%		
Not at all prepared	2	2%	1	1%	1	1%		

Left First Nursing Position

6 Month Survey

	Control group (n=104)		25% group (n=123)		50% group (n=121)		Effect size	P value
	freq	%	freq	%	freq	%		
Left first position	5	4.8%	9	7.3%	11	9.1%	0.07	0.462

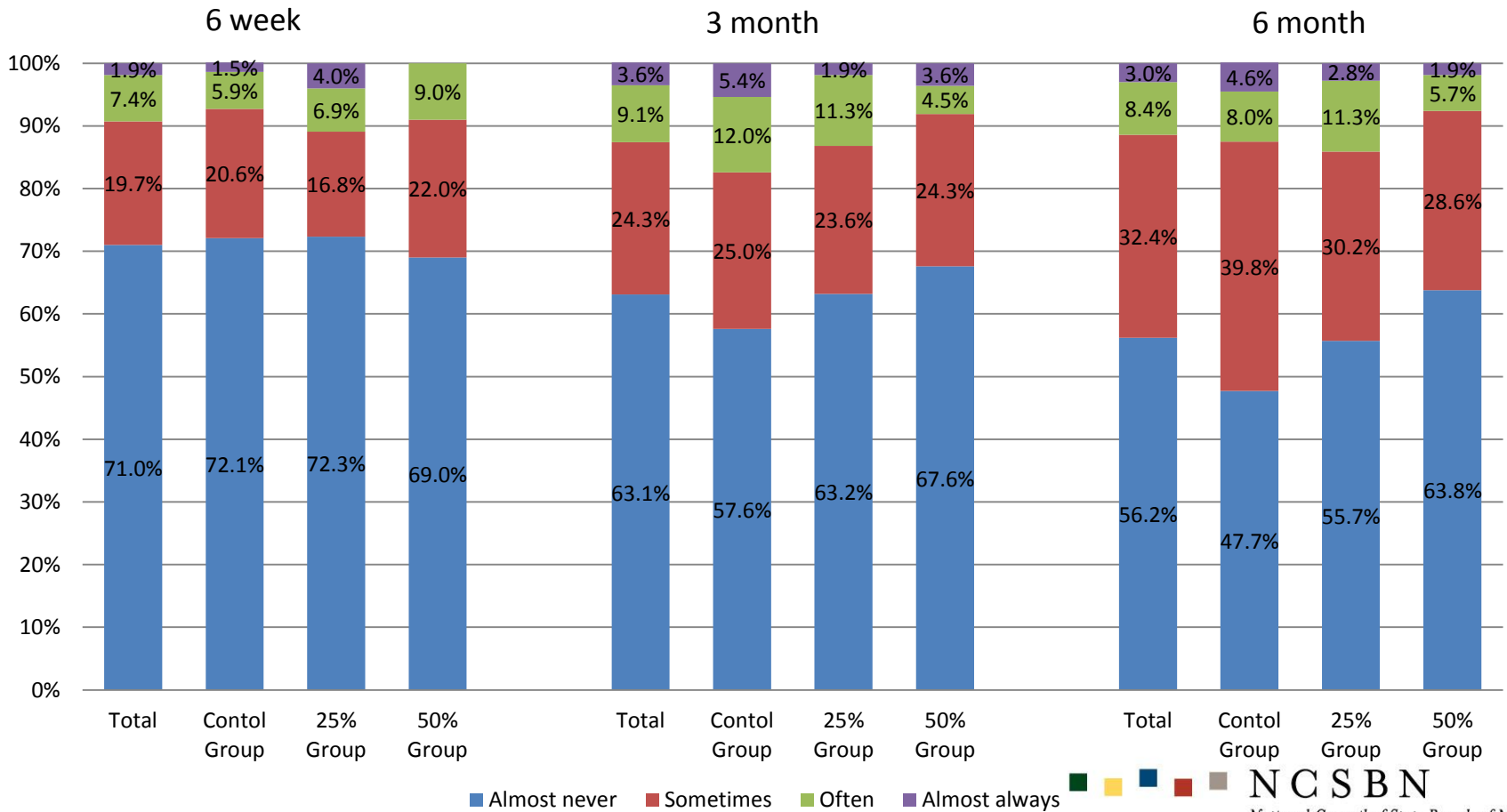
Patient Care Assignments

6 Month Survey

	Control group (n=88)		25% group (n=106)		50% group (n=105)		Effect size	P value
	freq	%	freq	%	freq	%		
Not challenging enough	4	5%	5	5%	5	5%	0.01	0.99
Just right	73	83%	89	84%	87	83%		
Too challenging	11	13%	12	11%	13	12%		

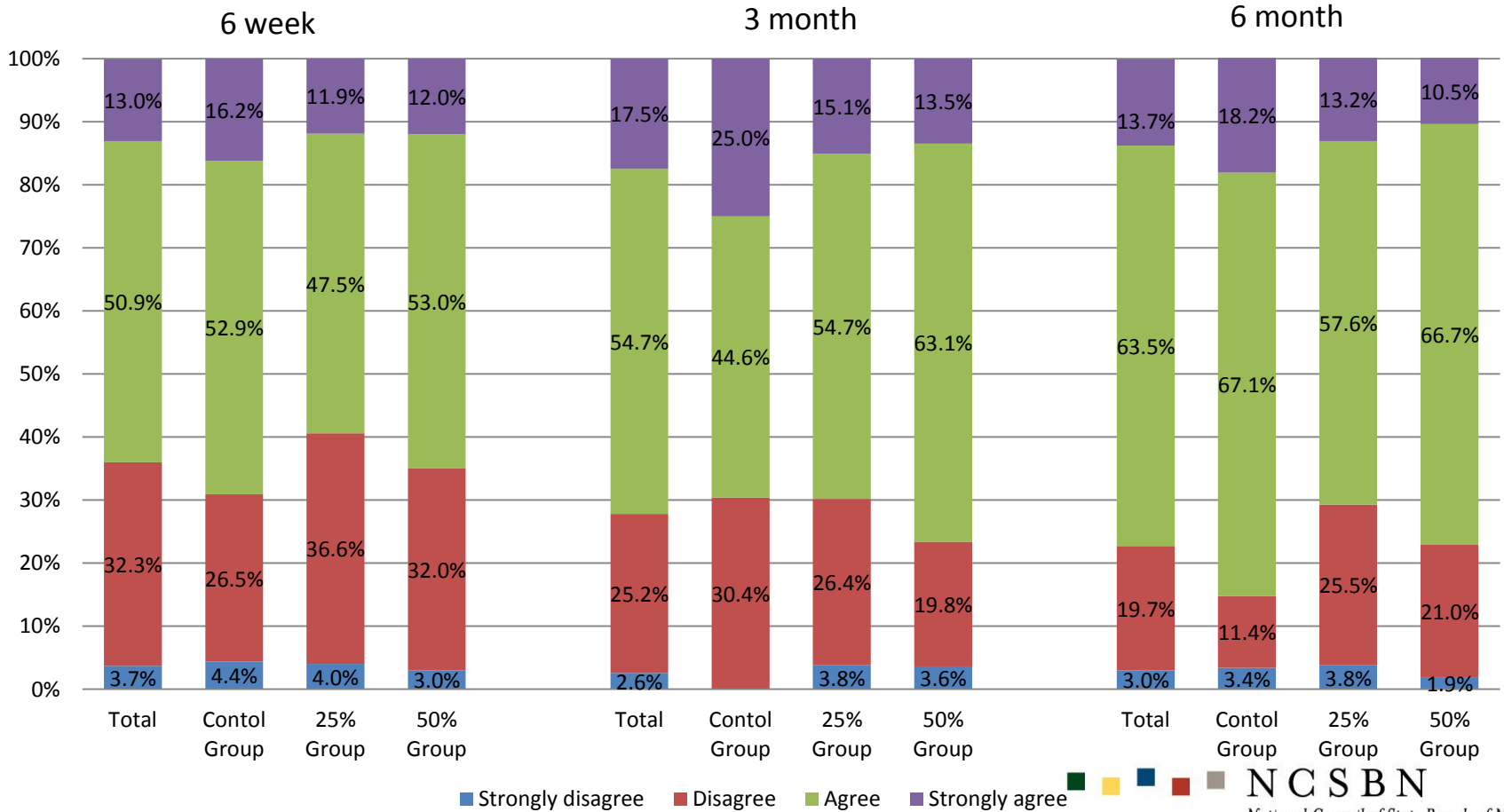
Workplace Stress

In the last week, I felt expectations of me were unrealistic



Workplace Stress

I am experiencing stress at work



Limitations

- Schools not randomly selected
- Used one method of conducting simulations
- Quality of the clinical experiences not assessed
- End of program preceptors and nurse managers not blinded
- End of program and nurse manager surveys relied on the study participants

Conclusions

1. Up to 50% simulation can be effectively substituted for traditional clinical experience in all core courses across the prelicensure nursing curriculum.
2. 50% simulation can be effectively used in various program types, in different geographic areas in urban and rural settings with good educational outcomes.

Conclusions

3. NCLEX pass rates were unaffected by the substitution of simulation throughout the curriculum.
4. All three groups were equally prepared for entry into practice as a new graduate RN.
5. Policy decisions regarding the use and amount of simulation in nursing needs to be dependent upon the utilization of best practices in simulation.

Qualifiers

These results were achieved using:

- INACSL Standards of Best Practice
- High quality simulations
- Debriefing method grounded in educational theory
- Trained and dedicated simulation faculty

Recommendations for Educators and Regulators


- Formally trained faculty in simulation pedagogy
- Use of theory-based debriefing methods using subject matter experts
- Adequate numbers of simulation faculty to support the learners
- Equipment and supplies to create a realistic environment

Summary



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THE OFFICIAL JOURNAL OF THE NATIONAL COUNCIL OF STATE BOARDS OF NURSING

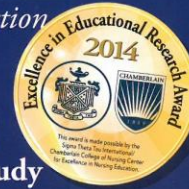


JOURNAL OF NURSING REGULATION

Advancing Nursing Excellence for Public Protection

The NCSBN National Simulation Study: A Longitudinal, Randomized, Controlled Study Replacing Clinical Hours with Simulation in Prelicensure Nursing Education

Jennifer K. Hayden, MSN, RN; Richard A. Smiley, MS, MA;
Maryann Alexander, PhD, RN, FAAN; Suzan Kardong-Edgren, PhD, RN, ANEF, CHSE;
and Pamela R. Jeffries, PhD, RN, FAAN, ANEF



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