

Evaluating the Impact of Supplemented Simulation and Traditional Learning Experiences on Student Decision Making and Clinical Competence

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- Objectives:
 - *1. Supplemental vs substituting*
 - *2. Instruments*
 - *3. Improve clinical decision making/competence*

Effect of Simulation Education on Student Nurses' Performance

INCREASES

- Clinical knowledge (Shinnick & Woo, 2015)
- Clinical decision-making (CDM) skills (Kaddoura, 2010)
- Teamwork (Nagle, McHale, Alexander, & French, 2009; Rush, Dyches, Waldrop, & Davis, 2008)
- Self-confidence (Fischer & King, 2013; Leonard et al., 2010; Maas & Flood, 2012; Ricketts, 2011)
- Increase in ability to recognize a change in patient status (Parker, 2014)

DECREASES

- Anxiety (Casida & Shpakoff, 2012)
- Medication errors (Dickson & Flynn, 2012)



What Is The Best Way to Integrate Simulation into Nursing Education?

- The National Council of State Boards of Nursing (NCSBN):

*high quality simulation can
substitute up to 50% of
traditional clinical hours*

(Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014)



- No difference in:
 - Student performance
(Meyer et al., 2011; Schlairet & Fenster, 2012, Hansen & Bratt, 2017)
 - **Clinical judgment**
(Meyer et al., 2011)
 - **Critical thinking**
(Schlairet & Fenster, 2012)
 - **Perception of clinical decision making**
(Woda, Gruenke, Alt-Gehrman, & Hansen, 2016)

Substitution vs. Supplementation

Substitution

- Students leave the hospital setting to participate in a simulation learning experience, **replacing** scheduled hospital clinical experiences

Supplementation

- Simulation learning is supplemental, **in addition** to hospital clinical experiences

Curricular Revision

- Major revision to the three Adult Health courses
 - Chronic Illness
 - Acute Illness
 - Transition to Practice



Curriculum Revision

	Group 1			Group 2	
Traditional Clinical Hours	Number of <u>substituted</u> Simulations	Number of <u>supplemented</u> Simulations	Traditional Clinical Hours	Number of <u>substituted</u> Simulations	Number of <u>supplemented</u> Simulations
Chronic Illness (1 day/week x 14 weeks)	0	0	Chronic Illness (2 days/week x 7 weeks)	0	4
Acute Illness (1 day/week x 14 weeks)	1	0	Acute Illness (2 days/week x 7 weeks)	0	4
Senior Clinical (104 hours with preceptor)	0	3	Senior Clinical (2 days/week x 7 weeks)	0	6
Total # Sims	1	3	Total # Sims	0	14

*Each Simulation lasted between 4-6 hours

Purpose

The purpose of this study was to determine whether these curricular changes influenced the development of nursing students.

- Perceived CDM
- Perceived self-confidence with CDM
- Perceived anxiety with CDM
- Clinical competence

Sample

- Two groups of baccalaureate nursing students
- Traditional pre-licensure program were compared
- Final semester-graduating seniors
- Group 1 (May 2015)
 - N=35
- Group 2 (May 2016)
 - N=36



Design and Method

- Quasi-experimental design
- Participation in a novel evaluative simulation
 - Last week of the semester
 - One student per simulation
 - Brief report
 - Chart review
 - Scenario
 - Identify change in condition
 - Contact provider
 - Implement both nursing and medical interventions
 - Evaluate patient response

Measurement Instruments

- Demographics
- The Clinical Decision Making in Nursing Scale (CDMNS)
 - Cronbach's α .83
- The Nurse Anxiety and Self-Confidence with Clinical Decision Making (NASC-CDM)
 - Cronbach's α for self-confidence .97 and anxiety .96
- Creighton Competency Evaluation Instrument
 - Cronbach's α .97-.98

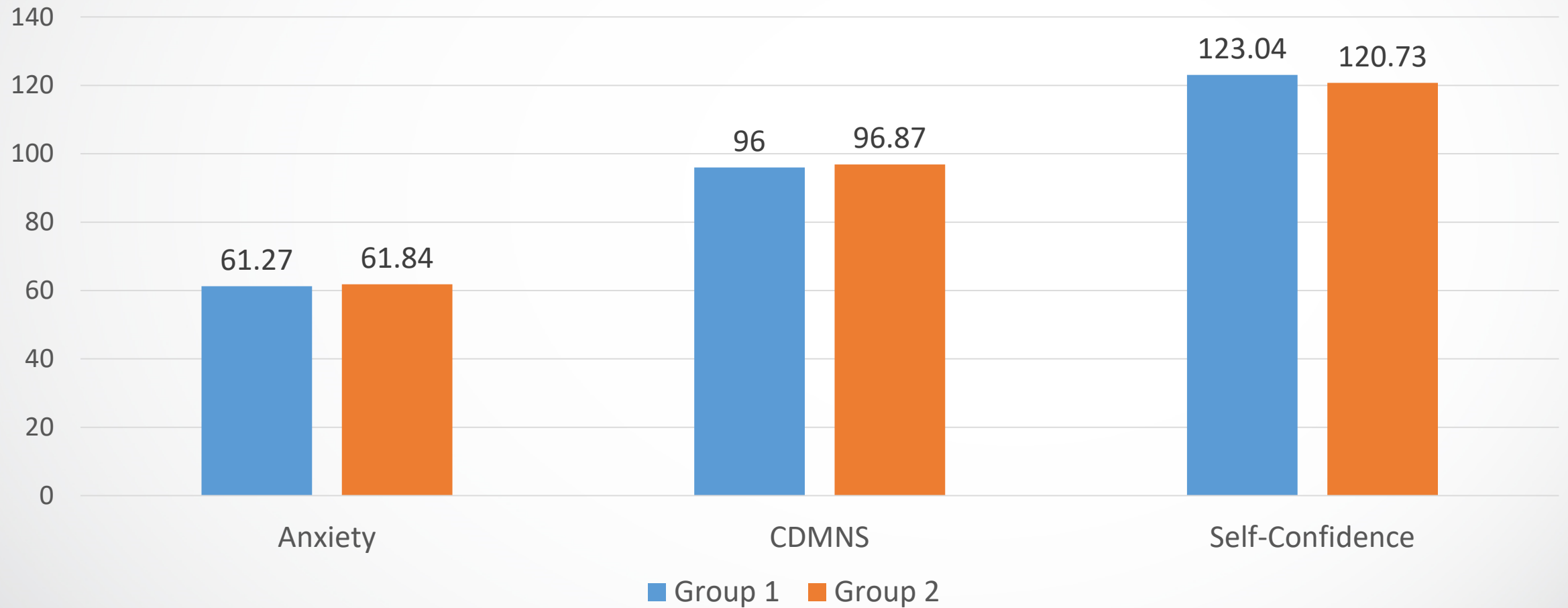
Data Analysis

- T-test
 - Demographic differences
- Inter-rater reliability
 - CCEI Group 1 and 2 Cohen Kappa of $k=1$
- Bayesian Paradigm
 - Inference in observed data

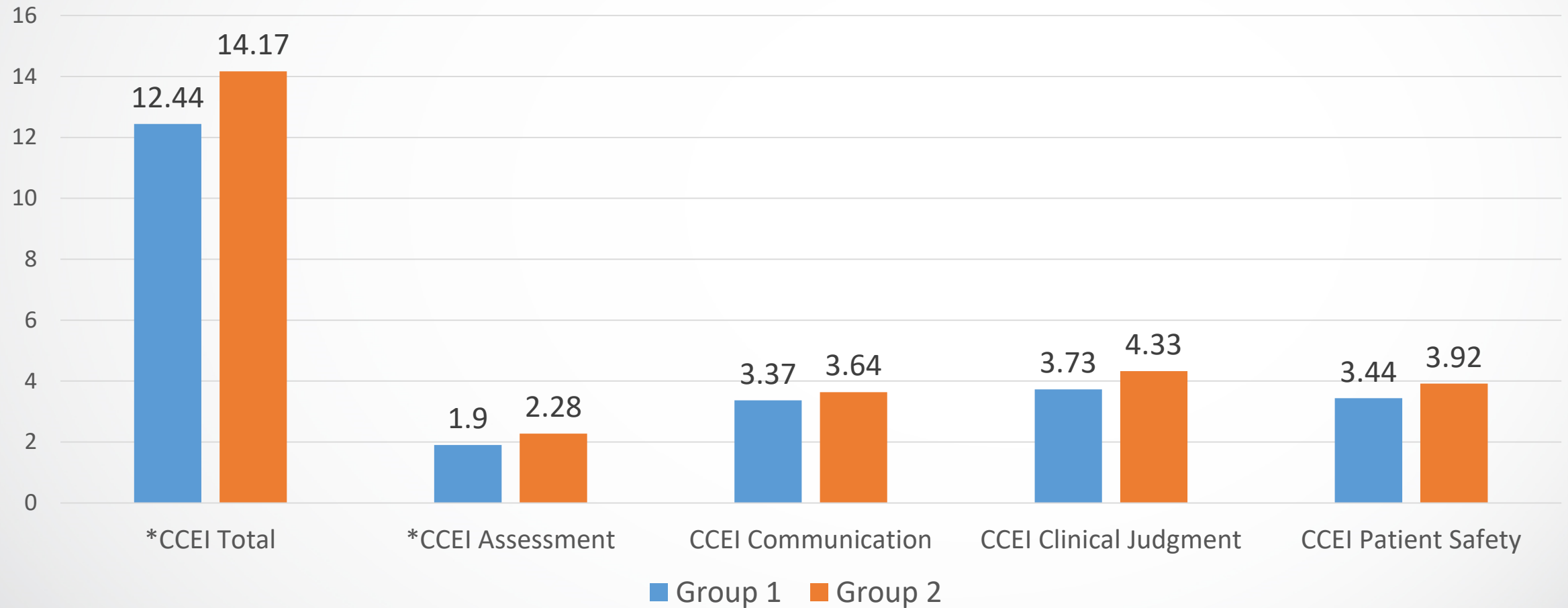
Descriptive Demographics

	Group 1 (N=35)	Group 2 (N=36)
Gender		
Male	3 (8.6)	1 (2.9)
Female	32 (91.4)	34 (97.1)
Age	Range= 21-27, Mean=22	Range= 21-24, Mean= 22
Ethnicity		
Caucasian	29 (82.9)	32 (88.9)
African American	3 (8.6)	3 (8.3)
Asian	1 (2.8)	1 (2.8)
Hispanic	2 (5.7)	0 (0)
Nursing Assistant		
Yes	5 (14.3)	*23 (63.9)
No	30 (85.7)	13 (36.1)
Nurse Intern		
Yes	7 (20.0)	*19 (52.8)
No	28 (80.0)	17 (47.2)

Mean Differences in Group Scores



Mean Differences in Group Scores



Observations

- Students with supplemented simulation (Group 2):
 - Prioritized their respiratory assessment
 - Verified the correct patient more often
 - Had fewer medication errors
 - Appeared more comfortable
 - Equipment
 - Using SBAR
 - Calling for assistance (STAT Team)

Limitations

- Volunteers
- Only evaluated one model (single site)
 - Only evaluated students in the simulated environment
- Unknown previous patient exposure
- Unable to blind groups

Conclusion

- Supplementation vs. substitution may be a better model
- Increasing simulation may result in graduating nursing students that perform **better patient assessments**, have **increased communication skills**, **clinical judgment**, and provide **safer care** in the simulated environment.

Future Research

- Further study is warranted
- Evaluate the impact of simulation on student competence in the traditional clinical setting
- Develop user friendly tools to assist instructors in the clinical settings to evaluate competence and decision making

Questions

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Mean Differences in Group Scores

	Group 1 Mean	Group 2 Mean	Mean Difference (SE)	Mean Difference 95% CI	Cohen d Mean (SD)	Cohen d 95% CI
CCEI Total	12.44	14.17	1.73 (0.61)*	0.53, 2.92	0.65 (0.23)	0.19, 1.11
CCEI Assessment	1.9	2.28	0.38 (0.12)*	0.14, 0.61	0.73 (0.24)	0.26, 1.19
CCEI Communication	3.37	3.64	0.27 (0.16)	-0.06, 0.59	0.38 (0.23)	-0.08, 0.84
CCEI Clinical Judgment	3.73	4.33	0.60 (0.32)	-0.02, 1.23	0.44 (0.23)	-0.02, 0.90
CCEI Patient Safety	3.44	3.92	0.48 (0.28)	-0.07, 1.03	0.40 (0.23)	-0.05, 0.86
CDMNS	96.0	96.87	0.87 (2.29)	-3.77, 5.18	0.09 (0.23)	-0.38, 0.54
Self Confidence	123.04	120.73	-2.31 (3.94)	-10.15, 5.48	-0.13 (0.23)	-0.59, 0.32
Anxiety	61.27	61.84	0.57 (4.27)	-7.89, 8.91	0.03 (0.23)	-0.43, 0.46

SE = Standard Error, SD = Standard Deviation, CI = Credible Interval

* = group means difference meaningfully different from 0