

# Simulation to Clinical Replacement Ratios: An Evaluation of the Research

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## Background

**INTRODUCTION:** Simulation has been used as a replacement for traditional clinical in prelicensure nursing for the past fifteen years according to known published evidence (Bearson & Wiker, 2005). The results of the National Council of State Boards of Nursing (NCSBN) National Simulation Study indicated that up to 50% of traditional clinical could be replaced with simulation at a 1:1 ratio of replacement without any differences in outcomes (Hayden et al., 2014). The NCSBN National Simulation Study validated the use of a 1:1 simulation-to-traditional clinical replacement ratio, but the ratio of replacement used by prelicensure nursing programs continues to vary across the United States and internationally (Breymer et al., 2015; Gore et al., 2012; Hayden, 2010).

**GAP:** Simulation experts have hypothesized that simulation provides a more efficient way to meet clinical objectives without detriment to program outcomes (Cornelius, 2012; Gore & Scheussler, 2013); however, no clear outcome data has been available in the literature on the use of different simulation to traditional clinical replacement ratios until recently. In addition, published studies vary in how they define clinical replacement ratios (i.e., simulation to clinical or clinical to simulation), which complicates the interpretation of findings.

**PURPOSE:** The purpose of this poster presentation is to discuss the evidence related to simulation to clinical replacement ratios found in studies conducted over the last five years.

## Methodology

Three simulation researchers collaborated to analyze their respective studies and discuss how each research project contributed to the body of knowledge regarding simulation to clinical replacement ratios over the last five years.

- Breymer et al. (2015) surveyed 1,400 prelicensure programs to determine the prevalent simulation to clinical ratio.
- Sullivan et al. (2019) compared the type, time-spent, number, and level of educational activity in the clinical versus simulation setting in 42 prelicensure nursing students.
- Zyniewicz (2019) compared the ATI Adult Medical Surgical Proctored Assessment Scores and NCLEX-RN scores of 878 prelicensure nursing students that experienced either a 1:1 or 1:2 simulation to clinical replacement ratio in their senior adult medical-surgical course.

**Definitions:**  
 1:1 – 1 hour of simulation = 1 hour of clinical  
 1:2 – 1 hour of simulation = 2 hours of clinical

## Findings

### U.S. Prevalence of Simulation to Clinical Replacement Ratio Utilization

	Hayden (2010)	Gore et al. (2012)	Breymer et al. (2015)	Smiley (2019)
<b>1:1 Replacement Ratio</b>	Up to 83%	58%	60%	77.8%
<b>1:2 Replacement Ratio</b>	*10%	9%	10%	**13.2%

\*worded as less than one hour of simulation equal to one hour of clinical - so also inclusive of other ratios (1:2, 1:3, 1:4 etc.)  
 \*\*worded as one clinical hour greater than one simulation hour - so also inclusive of other ratios (1:2, 1:3, 1:4 etc.)

### State Requirements for Ratios of Simulation to Clinical Replacement in Prelicensure Nursing Programs

Colorado	Allow 1:1 or 1:2
Mississippi	1:1
Oklahoma	1:1
Virginia	1:1

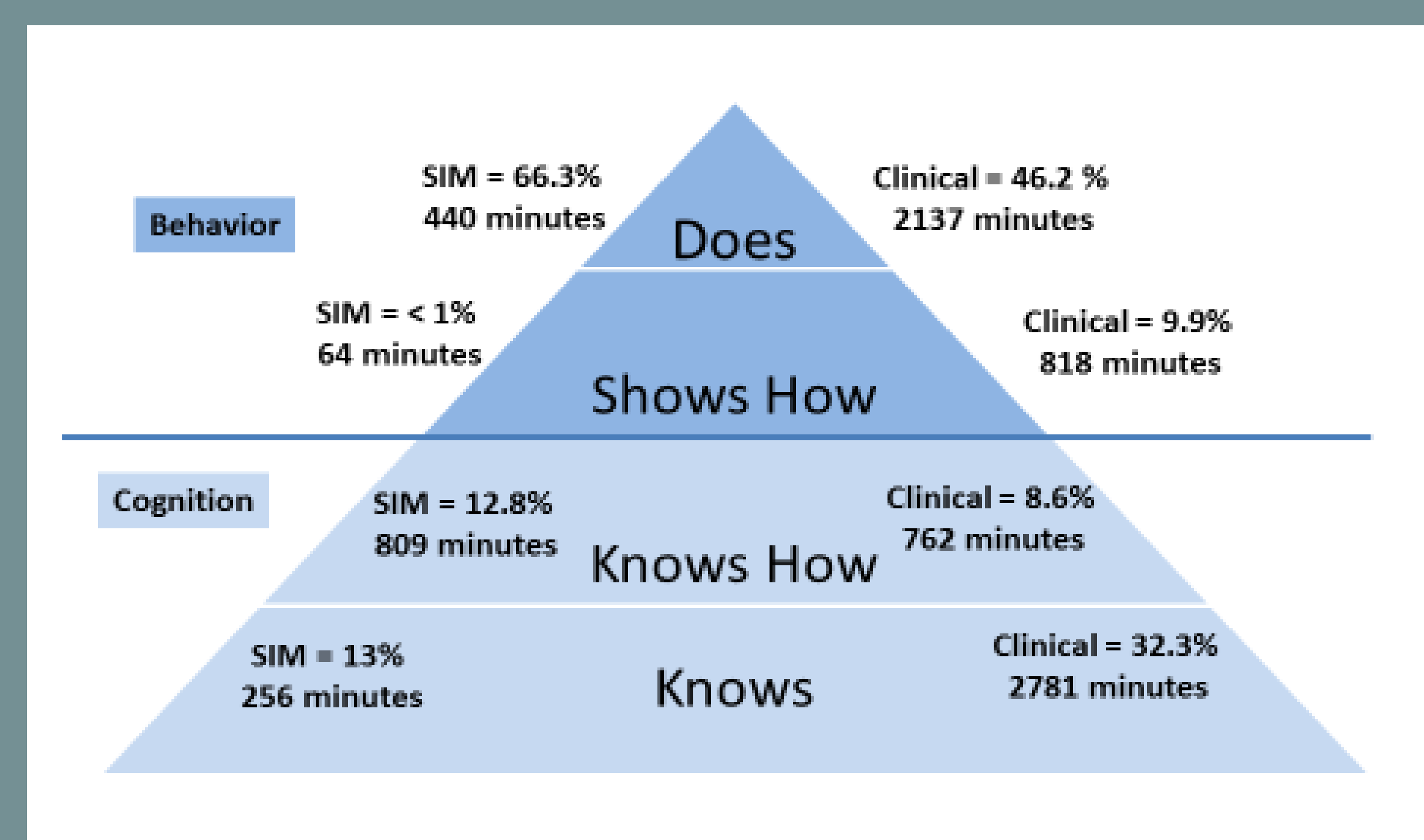
### Comparison of Outcomes of Prelicensure Nursing Students in 1:1 and 1:2 Simulation to Clinical Replacement Ratio Study Groups

	1:1 Study Group	1:2 Study Group	Significance
ATI Adult Medical Surgical Proctored Assessment Mean Scores	M = 71.2 SD = 7.92 n = 648	M = 69.36 SD = 7.48 n = 185	$F(1, 829) = 8.37, p = .004, \text{partial } \eta^2 = .01, \text{observed power} = .824$
NCLEX-RN Pass Rate	95.1%	93.7%	$\chi^2(1, N = 847) = .565, p = .452$

### Density and Intensity of Learning in Simulation Compared to Clinical

	Simulation		Clinical	
	# Activities observed (N = 379)	# Minutes recorded (N = 1,646)	# Activities observed (N = 1,538)	# Minutes recorded (N = 9,024)
Physical Assessment	53 (13.9%)	55 (3.3%)	120 (7.8%)	500 (5.5%)
Skills	30 (7.9%)	17 (1%)	50 (3.2%)	238 (2.6%)
Med Admin	49 (12.9%)	34 (2%)	167 (10.8%)	966 (10.7%)
Prebrief/Debrief/Post-conference	68 (17.9%)	1042 (63.3%)	32 (2%)	872 (9.6%)
Downtime	3 (<1%)	9 (<1%)	150 (9.7%)	1,337 (14.6%)

### Percent Simulation and Clinical Activities and Time Spent in Minutes Applied to Miller's Pyramid



## Discussion

The 1:1 simulation to clinical replacement ratio is the highest utilized clinical replacement ratio.

The prevalence of prelicensure nursing program use of 1:1 simulation to clinical replacement ratios and the use of replacement ratios where less time is used in simulation to replace clinical (1:2, 1:3, 1:4) have both increased over the last five years.

A standard method of defining the replacement of clinical with simulation (i.e., simulation to clinical or clinical to simulation) needs to be developed.

Although a statistically significant difference existed between the 1:1 and the 1:2 study groups' mean ATI scores, there was no meaningful difference between the mean ATI scores between study groups.

No relationship existed between simulation to clinical replacement ratio and NCLEX-RN pass rate.

Simulation is a highly intense and efficient learning environment with much of the time spent in critical thinking and independent activities.

Students independently completed more patient care activities at higher levels of functioning in simulation in 1/5<sup>th</sup> of the time of clinical.

The clinical setting is inefficient and has a limited focus on the application of knowledge and critical thinking.

## Conclusion

Evidence indicates most prelicensure nursing programs are utilizing a 1:1 simulation to clinical replacement ratio and show comparable results when using a 1:1 or 1:2 ratio. The evidence also indicates simulation is a more efficient educational method when compared to clinical. More research needs to be conducted on the outcomes of simulation to clinical replacement ratios. Current evidence supports the utilization of a 1:1 or a 1:2 simulation to clinical replacement ratio in prelicensure nursing programs.

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