

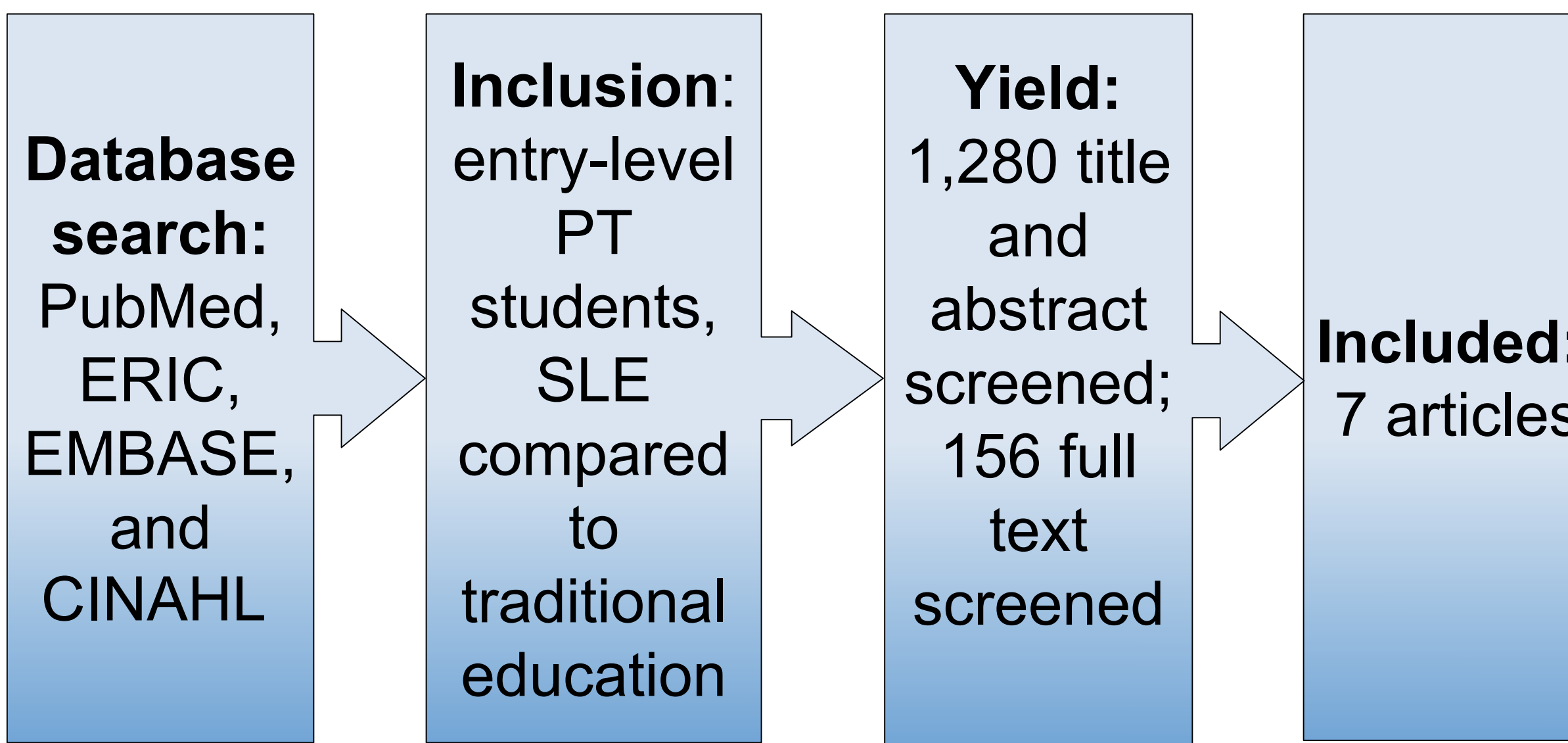
Background

- Simulated learning experiences (SLEs) are an array of structured activities that evoke actual or potential situations in clinical practice to develop learner knowledge, skills and attitudes while protecting patients from unnecessary risk.
- SLEs are used extensively in medical and nursing education. A survey of CAPTE-accredited physical therapy (PT) educational programs found that 70% of respondents use immersive SLEs in curriculum.
- The impact of SLEs on learning outcomes in cardiovascular and pulmonary (CVP) PT has not been established. In addition, simulation quality in PT education has not been examined.

Purpose

- To determine the effects of CVP SLEs compared with traditional education strategy on any outcome relevant to learning in entry-level PT education.
- To rate SLE level of learning evaluation (Kirkpatrick Model) and alignment with best practice standards (International Nursing Association for Clinical Simulation and Learning [INACSL] Standards).

Methods



Study Quality

Quality Measure	Study						
	1	2	3	4	5	6	7
MERSQI/18	15	10	15	12.5	15	8	9.5
NOS-E/5	4	4	4	5	4	5	4

Medical Education Research Study Quality Instrument (MERSQI)
 Newcastle Ottawa Scale-Education (NOS-E)

- Higher score indicates better quality

Results Table 1: Outcomes

Study	Duration	Simulation	Measures	Findings (I, Intervention, C, Control)
Replacing Clinical Experience				
1. Blackstock (2013)	1-wk	Acute & critical care unit cases with CVP dysfunction w/ SP and SimMan	APP, confidence	APP: I = C Confidence: ↑ I, ↑ C
	2-wks, alternating w/ clinic			APP: I > C in 5/7 standards Confidence: ↑ I, ↑ C
Supplementing Clinical Experience				
2. Hassam (2003)	20 min	Preterm infant model chest percussion	Technique Recall	↑ I
3. Jones (2011)	2, 4-hr	CVP cases w/ Nursing Anne VitalSim	APP	I = C
4. Jones: Self Efficacy (2011)	2, 4-hr		Self-efficacy correlation w/ APP	I (-) correlation C (+) correlation
5. Silberman (2016)	6-hr	HFHS CVP cases	CPI	I = C
6. Wellmon (2017)	90 min	HFPS medical emergency	IEPS, RIPLS, ATHCTS	IEPS: I > C in 3/4 RIPLS: I > C in 2/3 ATHCTS: I > C in 2/3
7. Wright (2018)	18-d	6-d CVP cases w/ SP	APP, Confidence	APP: I > C Confidence: ↑ I

Simulation: Standardized Patient (SP); High Fidelity Human Simulation (HFHS); High Fidelity Patient Simulation (HFPS) **Outcome Measures:** Assessment of Physiotherapy Practice (APP); Clinical Performance Instrument (CPI); Interdisciplinary Education Perception Scale (IEPS); Readiness for Interprofessional Learning Scale (RIPLS); Attitudes Toward Health Care Teams Scale (ATHCTS)

Results Table 2: INACSL Standards Alignment

Study	Needs Assessment	Measurable Objective	Format	Scenario for Context	Perception of Realism	Facilitative Approach	Pre-Briefing	Debriefing	Include Evaluations	Preparation Materials	Pilot test
1	+	+	+	+	+	-	-	+	-	-	-
2	+	+	+	-	-	-	+	-	-	+	-
3	+	-	-	-	+	+	-	-	-	+	-
4	+	-	-	-	+	+	-	-	-	+	-
5	+	+	+	-	+	+	-	+	-	-	-
6	+	-	+	+	+	-	+	+	+	+	-
7	-	-	+	+	+	+	-	+	-	+	-



Results Table 3: Levels of Learning Evaluation

Kirkpatrick Level				
	1. Reaction	2. Learning	3. Behavior	4. Results
# of Studies	0	7	0	0

Conclusions

Student Outcomes

- SLEs improve student confidence and attitudes.
- Longer duration SLEs may have a greater impact on performance.
- More research is needed to determine the potential for SLEs to replace time in clinical experiences.

Simulation Standards

- Most SLEs did not align with best practice standards.
- INACSL standards could be used to guide SLE development and implementation in PT education.

Learning Evaluation

- Studies need to effectively implement higher levels of learning in SLEs within CVP curriculum

Summary

- SLE development and implementation in PT education should be standardized.
- More high quality research evidence is required to determine the impact of SLEs on student outcomes to support the CVP curriculum.