Author(s):

Question: In-situ simulation compared to the education accrued during typical organizational practice for training interprofessional healthcare providers to improve clinician behaviors during patient care and/or patient outcomes?.

Setting:

Bibliography:

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	in-situ simulation	the education accrued during typical organizational practice	Relative (95% CI)	Absolute (95% CI)		
Mortality												
4	observational studies	serious	serious	not serious	not serious	none	876/30995 (2.8%)	962/21852 (4.4%)	**RR 0.80** (0.76 to 0.85)	**9 fewer per 1,000** (from 11 fewer to 7 fewer)	⨁◯◯◯ Very low	CRITICAL
Safety Event Mitigation												
4	observational studies	very serious	not serious	not serious	not serious	none	435 clinicians Median decrease in 2 LST's per sim (significant via statistical control chart rules) 10 LST's mitigated. Descriptive improvement in identified system hazards and in time to blood arrival (no statistics given 49 more LST's identified in-situ than in center based, no statistics			⨁◯◯◯ Very low	CRITICAL
Clinical Metrics of Care												

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	in-situ simulation	the education accrued during typical organizational practice	Relative (95% CI)	Absolute (95% CI)		
11	randomised trials	serious	not serious	not serious	serious	none	Note: Studies ranged from Observational, RCT, and Quasi-Experimental1123 clinicians 29004 patientsSummary:**Percentage Metrics:**1.2-49% change across multiple metrics. p values from 0.25 to 0.0001**Time-based Metrics:**Ranged from 2.3 to 360 sec improvement P values between 0.28 – 0.007 Detail:Changes in performance of various neonatal metrics of care between 0.16 – 3.4 (p between 0.0001 and 0.006)8% increase in uterotonic use (not sig), but significant increase in appropriate dose (15.98 ± 7.4 versus 25.1 ± 12.3; p < .001)Decreasing linear trend of postpartum hemorrhage cases (there was no assessment of significance, ant it seemed to have begun prior to the sim so this is of questionable meaning)Descriptive improvement in identified system hazards and in time to blood arrival No statistically significant changes in ED teamwork (specific numbers unreported)Improved CPR initiation 1.38±0.51 1.16±0.69 (22 seconds) p = 0.031. but no mortality improvement[Patient outcome (dead vs. alive) 2.343 0.487-11.265]PICU discharge status (dead vs. alive) 3.750 (0.661-21.251) Improved BLS initiation time 31% (p=0.019) and 28Improvement in electrical therapy for shockable rhythm (p=0.007),Improved trauma scores [6 points (p = 0011)], but this decayed in 12 months to a non-significant valueImproved time to ultrasonography (pre vs. 6-months post = 9.54 vs. 12-months post = 8.61; p = .0071).76% increase in frequency of near-perfect task completion (p < 0.001), ED resuscitation time reduced by 16%), p < 0.05, Mean resuscitation time reduced by 6 min p < 0.05Longer cord clamp times 53 ± 42 to 67 ± 47 s (p < 0.0005).Increase in infant stim 14.5% to 16.3% (p = 0.016). Increase in suction 13.0% to 15.8% (p < 0.0005)Decrease in BMV 7.3% to5.9% (p=0.005), faster spontaneous breathing in post cohort 9.8 ± 14.7 versus11.1 ± 18.3 (p < 0.0005). NOTE - THE BEST QUALITY RESULTS IN THIS SECTION ARE BELOW:Skills assessment: 49% point increase for AMTSL (95% CI 41 to 57), 42% point increase for recognition of retained placenta (95% CI 32 to 50) and 42% point increase (95% CI 39 to 45) for management of severe PPH.No significant differences in two of the primary indicators: all-cause near misses and PPH near misses among all women who delivered in a facility.Significant downward trend of PPH near miss (difference-in-differences of slopes −5.3, 95% CI −7.8 to −2.7, p<0.001)Avg Door-to-needle time- no significant diff. But significant door to needle decrease in post intervention (5 min p=0.03), when potential confounders factored out. This remained at 6 min diff (p=0.05). Door to groin time when potential confounders factored out was 21 min (p=0.04)				⨁⨁◯◯ Low	IMPORTANT

Diagnostic Decisionmaking

2	randomised trials	not serious	not serious	not serious	not serious	none	note: Cluster RCT and Quasi-Experimental 3150 patients/patient events Summary: **Percent change** 14-31% 95% CI (1.02-2.95) **Timed change**: 4.1 min (95%CI-6.2 to -1.9.) Detail: Mean decision to deliver interval decreased by 4.1 min (95%CI-6.2 to -1.9) 14% increase in complication recognition (IRR 1.14, 95% CI 1.02 to 1.27); a 31% increase hemorrhage recognition (IRR 1.31, 95% CI 1.13 to 1.52) 86% increase insepsis recognition (IRR 1.86, 95% CI 1.17 to 2.95).				⨁⨁⨁⨁ High	IMPORTANT

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	in-situ simulation	the education accrued during typical organizational practice	Relative (95% CI)	Absolute (95% CI)		
Technical Skills Measured in Patient Care												
1	randomised trials	not serious	not serious	not serious	not serious	none	179 clinicians Higher technical scores in intervention groups in Scenario 1 (17.4 [15.6–19.5], vs. 24.4 [18.7–26.6], P = .01) and Scenario 2 (17.5 [15.3–19.6] vs. 22.7 [21.3–25.0], P = .004				⨁⨁⨁⨁ High	IMPORTANT
Non-technical Skills Measured During Patient Care												
5	observational studies	very serious	not serious	not serious	not serious	none	311 clinicians 244 patients/patient events Summary: Percent change in score between 3-42% P values ranged from 0.049-0.001 Qualitative data only presented for some studies, with no observed change. Detail: Overall positive change in communication behavior (P = 0.006), Overall Reduction in “No callback” of 5 (3–6) 2 (1–2) 1 (1–2) p = 0.028 overall, which was maintained 3 months post study (p = 0.033) No significant change in readback, verbal , or non-verbal aspects of communication Improved trauma scores 6 points out of 21 on tool (p = 0011), but this decayed in 12 mo. Overall communication improved from median 5.0 (4.0–7.0) to median 8.0 (8.0–8.0), p = 0.012 No change in ANTS scores (scores of 3-4 throughout study period. Mean notechs score increased 1 pt. (16.7 to 17.7) p <0.05				⨁◯◯◯ Very low	IMPORTANT
Resource Impact												
0							0/0	0/0	not estimable		-	
Cost Impact												
0							0/0	0/0	not estimable		-	
Adverse Emotional Impact												
0							0/0	0/0	not estimable		-	
Adverse Care Impact												
0							0/0	0/0	not estimable		-	

CI: confidence interval; **RR:** risk ratio