A Comparison of Manikin-Based High-Fidelity Simulation to Synchronous Screen-Based Virtual Simulation

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Virtual Simulation Evaluated to be as Effective When Quality Conditions Met

Introduction

- ❑ High fidelity simulation in nursing education is supported by research[1,2].

- ❑ Virtual simulation (V-sim) is an alternative when high fidelity is not feasible[3].

- ❑ There is support for V-sim, but many studies operationalized it differently[5-8].

- ❑ Often V-sims were asynchronous, used avatars, or did not incorporate real-time, instructor-led debriefing[9].

- ❑ No studies were found that directly compared existing high-fidelity sims to the same sim delivered synchronously as a V-sim.

Methods

- ❑ Quasi-experimental design

- ❑ Existing sims on sepsis and cirrhosis/ GI bleed converted to synchronous V-sims using photos, videos, and audio clips on PowerPoint with same objectives.

- ❑ Each sim was preceded by prebrief, learners were provided with chart and given shift report. Assessment findings presented when asked for.

- ❑ Each session was followed by an in depth debriefing.

- ❑ All sessions conducted by same instructor and after each session students completed 20-item Likert scale evaluation.

Results

- ❑ Sample of 31 senior BSN students completed manikin sim and 38 completed V-sim

Student Evaluation of Selected Learning Outcomes

Learning Outcome	V-sim		Manikin Sim		$t(67)$	p
	M	SD	M	SD		
The simulation was realistic	5.74	1.55	6.29	.90	1.711	.092
I am better prepared to care for patients	6.13	1.21	6.26	1.03	.461	.647
I better understand the pathophysiology	6.53	.65	6.81	.40	2.200	.031
I better understand the pharmacology	6.32	.87	6.65	.55	1.824	.073
I am more confident in decision-making	6.26	.92	6.26	.82	.024	.981
My assessment skills improved	5.87	1.30	6.29	.78	1.588	.117
I was challenged to think like a nurse	6.61	.59	6.39	.75	1.338	.186
I am better prepared to use SBAR	6.63	.59	6.35	.75	1.711	.092
Debriefing provided time to reflect	6.54	.65	6.65	.55	.708	.481
Debriefing summarized key learning	6.61	.55	6.68	.54	.548	.586
Instructor helped me think critically	6.71	.46	6.74	.44	.286	.775

Note. Scale: 1 = strongly disagree 2 = disagree 3 = somewhat disagree 4 = neutral 5 = somewhat agree

6 = agree 7 = strongly agree
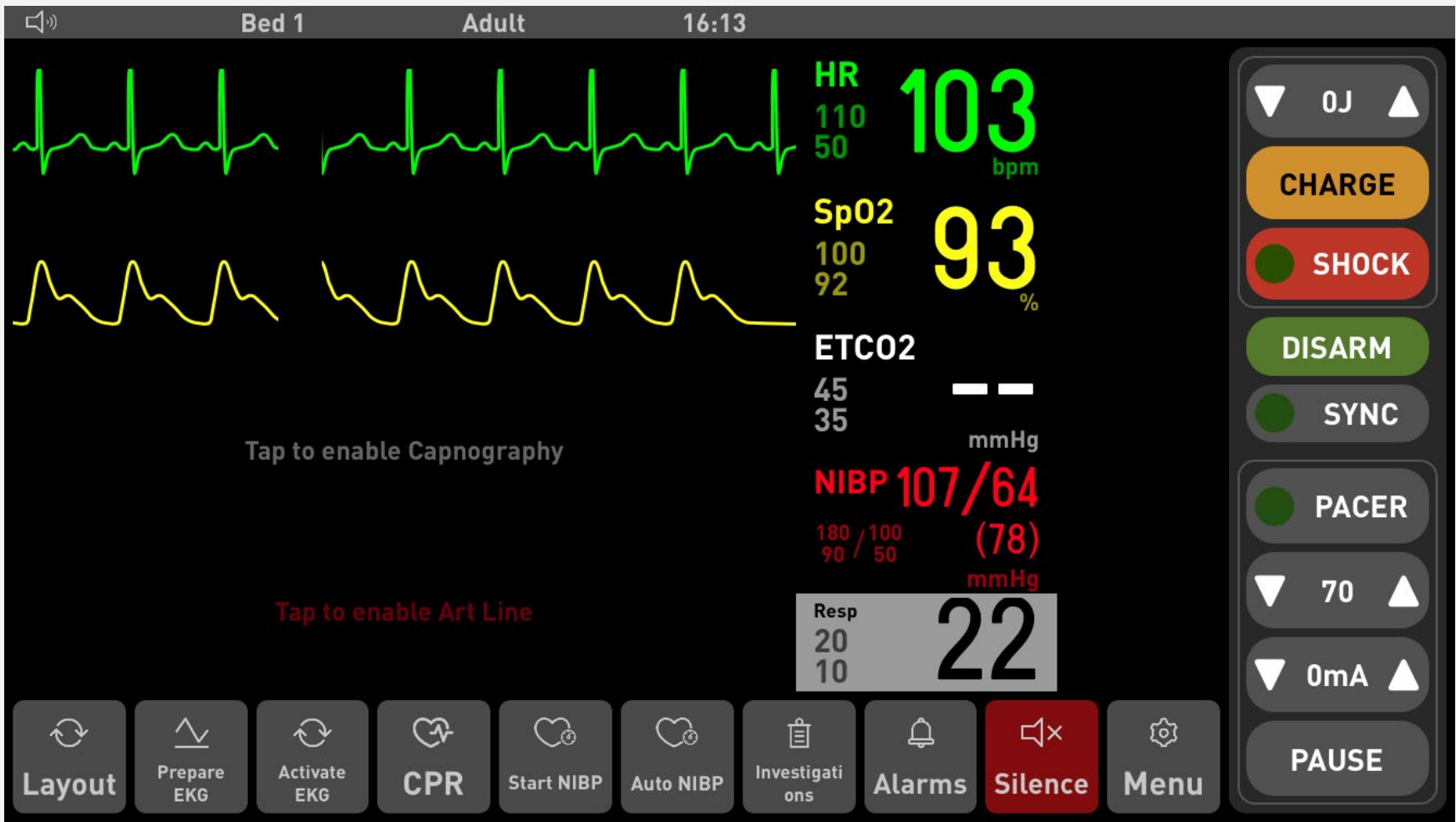
Discussion

- ❑ No significant differences in student evaluations on any item except learning of pathophysiology.

- ❑ It was surprising that there was no difference on items related to realism, and assessment skills given the virtual format.

- ❑ A strong emphasis on conceptual fidelity was embedded in the design of the V-sims.

- ❑ Real time facilitation followed immediately by a synchronous debriefing were unique elements to these V-sims.

- ❑ Limitations include the use of a single site and lack of participant randomization

- ❑ It would be useful to replicate this study in multiple sites with participant randomization and to include additional measures of learning outcomes.

Conclusions

- ❑ An existing high-fidelity, manikin-based simulation can effectively be converted to a virtual simulation using commonly available tools like PowerPoint, pictures, audio clips, and video clips.

- ❑ V-sim was evaluated by learners to be as effective as high-fidelity, manikin-based simulation when the V-sims were conducted synchronously on-line and followed by a facilitated, theory-based debriefing.

- ❑ Conceptual fidelity was more important than physical fidelity in obtaining learner buy-in.

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