10-28-2022

Effectiveness of Simulation-based Learning compared to Integrated Clinical Experience in Development of DPT Students' Clinical Decision-Making Skills

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Pre-Simulation-Based Course
Post-Simulation-Based Course
Post-Integrated Clinical Experience

Background

- Simulation-based learning has a significant footprint on entry-level physical therapy programs.[1]
- Students' clinical decision-making (CDM) skills development through simulation-based learning (SBL) format when compared to the Integrated Clinical Experience (ICE) remains unknown.
- Self-efficacy of Clinical and CDM skills tool measures clinical skills, clinical decision-making, and total self-efficacy of clinical and CDM skills.[2]
- A need to evaluate the effectiveness of simulation-based learning compared to ICE in development of CDM skills.
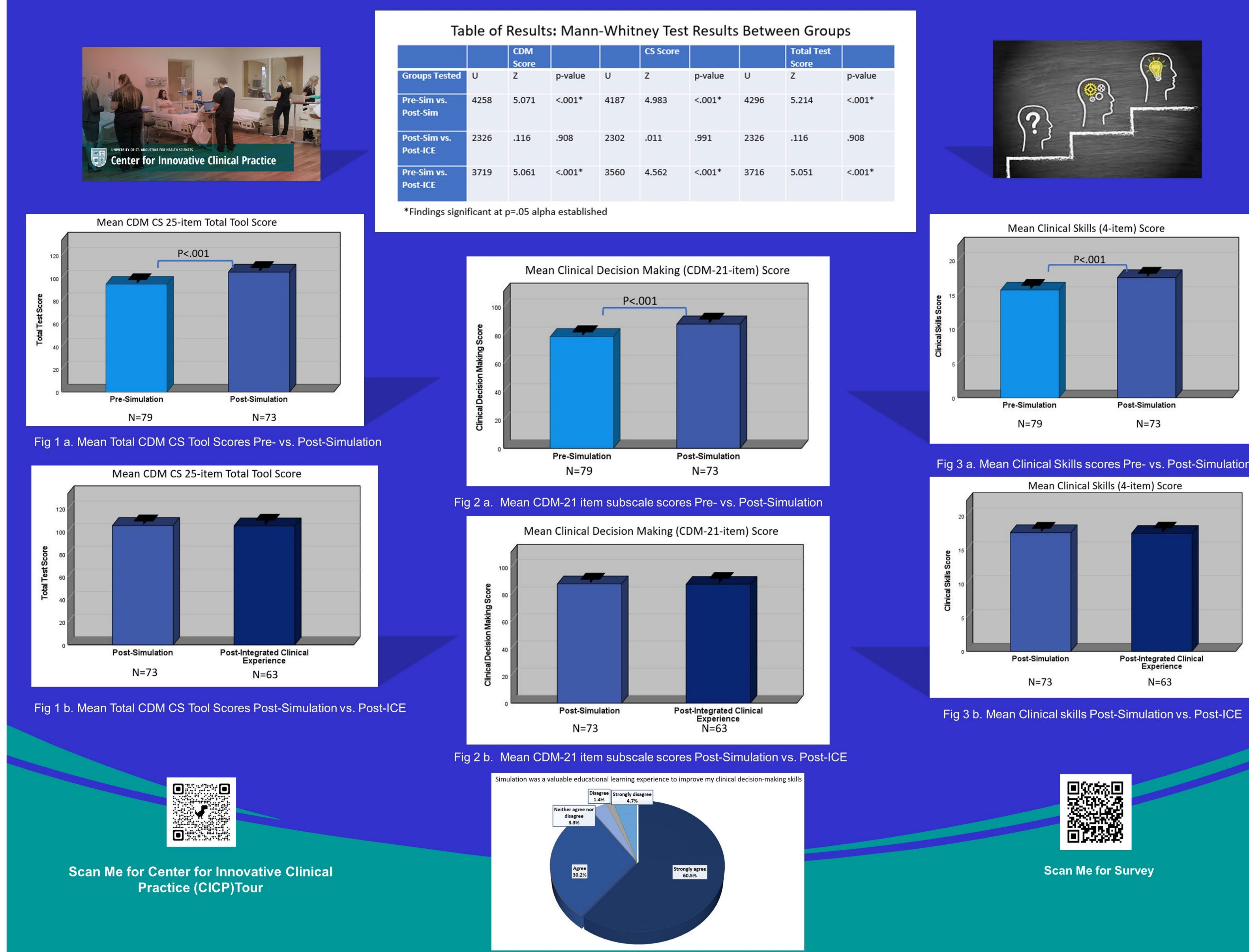
Purpose

The purpose was to compare the effectiveness of simulation-based learning and the Integrated Clinical Experience (ICE) in the development of DPT student clinical decision-making skills as determined by:

(1) Total Clinical Decision Making (CDM) Clinical Skills tool scores,
(2) CDM (21-item) subscale scores, and
(3) Clinical Skills (4-item) subscale scores.[2]

Methods

- Survey-based descriptive and exploratory cross-sectional design.
- The survey was administered before and after an 8-week simulation course, and after a 6-week Integrated Clinical Experience (ICE).
- Survey comprised of 36-questions on clinical decision making (CDM), clinical skills, self-efficacy, demographics, and effectiveness of simulation.
- Participants- 215 second year DPT students from private health science university during Fall 2021-Summer 2022 simulation–based learning course and ICE.
- N=79 students pre-simulation, N=73 post-simulation, and N=63 post-ICE.

Results

Table of Results: Mann-Whitney Test Results Between Groups

Groups Tested	CDM Score			CS Score			Total Test Score		
	U	Z	p-value	U	Z	p-value	U	Z	p-value
Pre-Sim vs. Post-Sim	4258	5.071	<.001*	4187	4.983	<.001*	4296	5.214	<.001*
Post-Sim vs. Post-ICE	2326	.116	.908	2302	.011	.991	2326	.116	.908
Pre-Sim vs. Post-ICE	3719	5.061	<.001*	3560	4.562	<.001*	3716	5.051	<.001*

*Findings significant at p=.05 alpha established

Center for Innovative Clinical Practice

Mean CDM CS 25-item Total Tool Score
Fig 1 a. Mean Total CDM CS Tool Scores Pre- vs. Post-Simulation (Pre-Simulation N=79, Post-Simulation N=73) P<.001

Mean CDM CS 25-item Total Tool Score
Fig 1 b. Mean Total CDM CS Tool Scores Post-Simulation vs. Post-ICE (Post-Simulation N=73, Post-Integrated Clinical Experience N=63)

Mean Clinical Decision Making (CDM-21-item) Score
Fig 2 a. Mean CDM-21 item subscale scores Pre- vs. Post-Simulation (Pre-Simulation N=79, Post-Simulation N=73) P<.001

Mean Clinical Decision Making (CDM-21-item) Score
Fig 2 b. Mean CDM-21 item subscale scores Post-Simulation vs. Post-ICE (Post-Simulation N=73, Post-Integrated Clinical Experience N=63)

Mean Clinical Skills (4-item) Score
Fig 3 a. Mean Clinical Skills scores Pre- vs. Post-Simulation (Pre-Simulation N=79, Post-Simulation N=73) P<.001

Mean Clinical Skills (4-item) Score
Fig 3 b. Mean Clinical skills Post-Simulation vs. Post-ICE (Post-Simulation N=73, Post-Integrated Clinical Experience N=63)

Simulation was a valuable educational experience to improve my clinical decision-making skills

Scan Me for Center for Innovative Clinical Practice (CICP)Tour

Scan Me for Survey

Results

Clinical Decision Making (CDM) clinical skills total :
- Significant increase in score from pre-simulation (Md=94, n=79) to post-simulation (Md=103, n=73), U=4296, r=.42, p=<.001 (Fig 1.a; Table).
- No significant difference in post-simulation (Md=103, n=73) and post-ICE (Md=102, n=63), U=2326, p=.908 (Fig 1b; Table).

CDM (21-item) subscale:
- Significant increase in score from pre-simulation (Md=79, n=79) to post-simulation (Md=86, n=73), U=4257.5, r=.41, p=<.001 (Fig 2.a; Table).
- No significant difference in post-simulation (Md=86, n=73) and post-ICE (Md=85, n=63), U=2326, p=.908 (Fig 2.b; Table).

Clinical Skills subscale:
- Significant increase in score from pre-simulation (Md=16, n=79) to post-simulation (Md=17, n=73), U=4187, r=.40, p=<.001 (Fig 3.a, Table).
- No significant difference in post-simulation Md=17, n=73) and post-ICE (Md=17, n=63), U=2302, p=.991 (Fig 3.b; Table).

Discussion/Conclusion

Significant increases in DPT Students clinical skills, clinical decision-making, and total self-efficacy of clinical and CDM skills tool scores were found between pre-simulation and post-simulation in curriculum.

No Significant differences in clinical skills, clinical decision-making, and total self-efficacy of clinical and CDM skills tool scores were found between post-simulation and post-ICE, although CDM skills continued to improve during ICE, suggesting a ceiling effect for development of CDM skills may exist.

Findings suggest simulation-based learning was effective in preparing DPT students to begin their ICE with enhanced clinical skills, clinical decision-making, and self-efficacy.

We recommend expanding DPT students' simulation-based learning to optimize the development of clinical decision-making skills prior to clinical experiences.[3,4]

Limitations

- DPT students recruited were from one large private university.
- Self-efficacy answer choice options were defined on a 5-point scale limiting elaboration on participant responses.

Future Research

- Investigate longitudinal factors impacting development of clinical decision-making skills to facilitate best practice when transitioning from classroom to clinical experiences.
- Suggest use of Self-efficacy of Clinical and CDM skills tool to identify students who may benefit from remediation before and during clinical experiences.

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