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The Effect of Collaborative Patient Simulation in Health Education Students: A Critically Appraised Topic

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Due to the complex health issues of patients, and concerns with the quality of care, there is a need for more effective and well-organized healthcare. The National Academy of Medicine includes "work in interdisciplinary teams" as one of the core competencies to improve patient care and address concerns plaguing the healthcare system.[1] It is imperative that all healthcare providers possess the ability to cooperate, communicate, and collaborate with others.[1] However, negative attitudes towards other professions, lack of interprofessional training, and decreased communication can undercut the interdisciplinary approach.[2,3] One way to prevent this is to promote training or retraining of various professionals on the importance of collaborative communication and teamwork.[2]

Health professions graduates will enter the workforce with the expectation of working in these interprofessional healthcare teams, and interprofessional education is a way to prepare them for encounters.[2] Collaborative learning with students focusing on core interdisciplinary skills has shown positive outcomes.[2,3,4] Interprofessional education (IPE) is a set of educational activities that enable professionals to gain an understanding of, learn from, and collaborate to enhance partnership and quality of care.[4] Simulation-based learning encourages collaboration, interaction with other professions, and team-based decision-making.[3]

Because of the theory of situated learning, which states that learning occurs through social interaction and cooperation among peers, the learner's environment, and genuine learning practices, the evaluation of student perception is pertinent.[5] One reliable and valid evaluation method is the Students' Perceptions of Interprofessional Clinical Education-Revised (SPICE-R).[6] It is a 10-item self-report comprised of three subscales: interprofessional teamwork and team- based practice (two items); roles and responsibilities for collaborative practice (two items); and patient outcomes from collaborative practice (six items).[5] The instrument is scored from 1-5, from strongly disagree to strongly agree.[5] While it is known that interprofessional education in health education curriculum improves students' attitudes toward other health professions and collaborative teamwork, implementation challenges exist.

Focused Clinical Question

What is the efficacy of collaborative patient simulation for changing attitudes about interprofessional collaboration in healthcare students?

Search Strategy

A search of PubMed and CINAHL was conducted in June of 2023 following a PIO strategy to evaluate the question.

- **P**atient group: Undergraduate or graduate healthcare students
- **I**ntervention: Interprofessional education activity
- **O**utcome: Scores on SPICE-R

The following Boolean phrases were used:

- Interprofessional education
- Interprofessional education AND athletic training
- Interdisciplinary AND healthcare education
- Interprofessional education AND simulation training AND SPICE-R

Inclusion criteria were:

- Studies that included the SPICE-R instrument for student feedback
- Studies that included a simulation of interprofessional activity
- Studies with 2 or more undergraduate or graduate health professional groups that were engaged in an interprofessional activity
- Limited to the last 5 years

Exclusion criteria were:

- Studies where the IPE simulation was performed electronically or if a simulation was not performed (passive learning)
- If numerical data supporting the findings of the study were not provided

Evidence Quality Assessment

Each included article was appraised to assess for internal and external validity concerns. The JBI Critical Appraisal Checklist for Quasi-Experimental Studies was used to critically appraise non-randomized experimental studies.[7] This critical appraisal tool is a 9-question checklist with the reviewer responding to each question with a yes, no, unclear, or not applicable.[7] Cohort studies were assessed using the STROBE checklist.[8] The STROBE is a 22-item checklist and is scored by the number of items that are correctly reported, divided by the number of items that need to be reported and presented as a percentage.[8] For both appraisal methods used, a higher score indicates higher methodological quality.

Results of Search

Summary of Search, Evidence Appraised, and Key Findings

In total, this search yielded 121 records from PubMed (Figure 1). Each article was then reviewed for inclusion of simulation training between at least two different professions, which yielded 15 relevant articles. The articles were then further assessed for inclusion of the SPICE-R, which resulted in six articles. Finally, the results section was evaluated to check for numerical data stating the significant change levels in SPICE-R scores. The three articles in Table 1 met the inclusion criteria and demonstrated an improved perception of IPE simulation-based activities.[3,6,9]

Figure 1 – Search Results

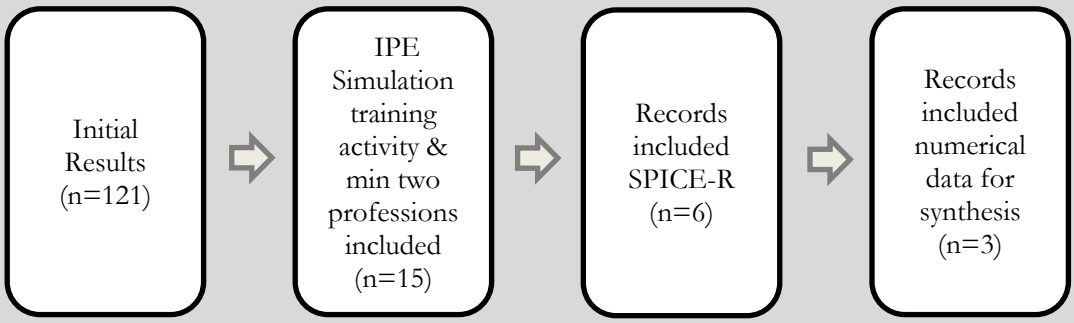

Table 1.
Characteristics of Included Studies

	Study		
Author(s)	**Carmack et al.[9]**	**Morrell et al.[6]**	**Fusco et al.[3]**
Study title	Interprofessional diabetes escape room with nursing and athletic training students	Interprofessional education week: The impact of active and passive learning activities on students' perceptions of interprofessional education	Measuring changes in pharmacy and nursing students' perceptions following an interprofessional high-fidelity simulation experience
Study participants	Athletic training students (n=18), Nursing students (n=16)	Athletic training (n=29), Nursing (n=80), Occupational Therapy (n=51), Physical Therapy (n=10), Public Health (n=12), Other (n=8)	Pharmacy students (n=133); Senior Nursing students (n=121)
Inclusion/ exclusion criteria	Senior level undergraduate nursing students and entry-level graduate AT students	Exclusion: students who did not complete both pre and post-IPE Week assessments	Inclusion: third-year pharmacy students and senior nursing students

			Exclusion: Students who did not complete the post-survey
Outcome measures	SPICE-R survey pre and posttest	SPICE-R survey pre and posttest	SPICE-R survey pre and posttest
Results	SPICE-R was statistically significant for improvement in scores in all three IPE factors after participating in the Diabetes Escape Room. Separate scores for both professions showed significant improvement in *roles/responsibilities for collaborative practice* and *patient outcomes from collaborative practice.*	N=190 students 80.5%--attended an active learning event 19.5%--attended a passive learning event Significant increase in perceptions of IP healthcare for all 3 factors (p<.001) Passive learning groups had a statistically significant increase in 2/3 factors: (p=.021) roles/responsibilities and (p=.016) patient outcomes from collaborative practice. Active learning group--statistically significant change in SPICE-R (p<.001) Change pre to post IPE Week passive and active learning events--(p=.035)	N=104 (pharmacy) and 93 (nursing) Median score increases were seen for all SPICE-R items (p<0.01) for pharmacy and 9 of the 10 items (p<0.01) for nursing students.
Evidence Quality Assessment	JBI CAC 7/9	STROBE 19/22	STROBE 20/22
Support for the answer	Yes	Yes	Yes

Results of Evidence Quality Assessment

Two studies were assessed using the STROBE checklist. The Fusco and Foltz-Ramos[3] study received a score of 20/22 and the Morell et al.[6] study received a score of 19/22. Each study lost points for not including potential sources of bias or funding sources. There was also a point deduction for Morell et al.[6] due to not reporting other analyses performed. Both cohort studies had a Strength of Recommendation Taxonomy (SORT) level of evidence of 2.[10] The third study, Carmack et al.,[9] was assessed using the JBI Critical Appraisal Checklist for Quasi-Experimental Studies and scored a 7/9. Points were deducted for not including a control group and a lack of clarity when providing details concerning if the participants in comparisons were similar. It had a SORT level of evidence of 2.[10]

Clinical Bottom Line: Strength of Recommendation

Consistent evidence supports the use of collaborative patient simulations to improve attitudes about interprofessional collaboration. Morell et al.[6] concluded that student perceptions of interprofessional healthcare increased significantly for each of the three SPICE-R criteria. Fusco and Foltz-Ramos[3] discovered that nursing and pharmacy students demonstrated significant increases in all or most elements of the SPICE-R following a high-fidelity simulation, demonstrating the potential effectiveness of performing experiential learning. Carmack et al.[9] found that the SPICE-R scores significantly improved after students participated in an Escape Room simulation. Most studies demonstrated that students' perceptions of interprofessional clinical education were high at baseline but increased after the IPE activity. Simulation is a valuable educational tool to enhance interprofessional clinical education and collaboration. The SORT Strength of Recommendation Grade is B.[10]

Implications for Practice, Education, and Future Research

The results of this critical appraisal demonstrated that students responded positively to interprofessional collaboration as measured by the SPICE-R. The active simulation activities resulted in significantly higher post-scores in all the factors of the scale: roles and responsibilities, team-based practice, and patient outcomes. As a result, when educators are developing and planning IPE activities, they should consider including active learning scenarios that involve interaction with other health professionals.[6] If choosing to do an interprofessional escape room, it was found that this method could be applied to any topic area with various health professionals.[6,9] While there were improvements in perceptions of IPE after the activity, all three studies did not have a control group to compare pre and post-tests.[3,6,9]

There are several challenges with IPE, which can include programs housed across academic departments and different educational levels (e.g., bachelor's, master's, post-professional), with some programs lacking experience with professional collaboration.[4] It is believed that these challenges could be due to the lack of support from the department in which the program is housed or the institution's lack the readiness structures.[4] Another challenge that programs face is the lack of resources and time to encourage collaborative learning and the availability of ample group space.[11] Accurately matching student knowledge of learning poses a challenge when evaluating student levels for a comparable experience and result.[9] Educators must consider not only the level of exposure to IPE, but also students' clinical and healthcare knowledge, skills, and abilities.[9] Additionally, the timely formulation of outcome measures within the framework of strategic planning can inform the assessment techniques and ensure that all expectations are fulfilled for each discipline.[11]

As stated by several studies,[3,6] future research is needed to identify if the positive student perceptions of other professions acquired through IPE activities continue after graduation into their careers. With IPE simulation activities becoming more prevalent in health professional programs, further research into which type of simulation provides the best improvements in SPICE-R scores and meeting learning outcomes is needed. IPE activities that involve multiple sites or opportunities for exposure allow students to learn from and collaborate with the different professions versus a single-site scenario. Additionally, in the time since when the included studies were published[3,6,9] the SPICE-R was updated to SPICE-R2 (2022)[12] and needs to be used in future research. In the updated version, the introduction paragraph to the student includes additional professions as part of the healthcare team.[12] The wording of the ten items was changed to include patient satisfaction over patient outcomes, as well as the education of the student to establish collaborative

relationships.[12] Finally, more information is needed regarding patient satisfaction, experiences, and outcomes when treated by healthcare professionals who have been specifically trained in IPE.

CAT Expiration Date

CATS have limited life and should be revisited approximately 2 years after publication.

Conflicts of Interest

None of the authors reported any conflicts of interest.

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