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Assessing the Effect of Simulation-based Learning on Students' Self-Efficacy and Performance: A Comparison Between Instructor and Student Self-Assessment

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Abstract

Background: Simulation-based learning (SBL) has become an integral component of nursing education, enhancing students' clinical skills, self-efficacy, and learning satisfaction in a safe, controlled environment. Despite its growing implementation, a need remains to assess its impact on first-year nursing students' competence and confidence. **Aim:** This study aimed to evaluate the effect of simulation-based learning on nursing students' self-efficacy and compare student self-assessment and instructor assessment. **Design:** A quasi-experimental research design was utilized. **Setting:** The study was conducted within the simulation laboratory at the Faculty of Nursing, Badr University in Cairo. **Subjects:** A purposive sample of 81 first-year nursing students was selected for the study. **Tools:** Data collection was conducted using seven tools: (1) Demographic data and Student Engagement in Simulation-Based Learning data, (2) Generalized Perceived Self-Efficacy Scale (GPSS) to assess self-efficacy, (3) Creighton Simulation Evaluation Instrument (C-SEI) to evaluate clinical performance. **Results:** Most students were between 15 and 18 years old. Most participants were female and from rural areas. Nearly all students engaged in simulation activities 1-2 times using a single method. **Conclusion:** SBL significantly improved self-efficacy, with statistically significant differences between student self-assessment and instructor assessment across all performance items ($p < 0.001$) before the program, but the difference after was minimal. **Recommendations:** Continuously implementing and expanding simulation-based education within nursing curricula is recommended, ensuring structured debriefing sessions and diverse clinical scenarios to maximize learning outcomes.

Keywords: *Nursing education, Performance, Self-Assessment, Self-efficacy, Simulation-based learning.*

Introduction:

Simulation-based learning (SBL) approach allows students to practice clinical skills, make decisions, and solve problems in a controlled environment. The key advantage of simulation is its ability to recreate complex, high-risk scenarios that would be difficult or impossible to reproduce in actual clinical settings. The strength of simulation is its ability to provide immediate feedback for the students. Educational theories and frameworks discussed particularly the NLN/Jeffries Simulation Framework (**Jeffries, 2022).** The evidence-based approach promotes the design and evaluation of simulation-based learning by integrating key elements like context, design, and outcomes. It emphasizes active learning, feedback, and structured debriefing, enhancing student engagement and clinical competence **(Elendu et al., 2024).**

The perception of competence in nursing education refers to students' confidence in their ability to perform clinical tasks safely, accurately, and effectively. Simulation-based learning significantly enhances this perception by providing a realistic and risk-free environment where students can practice clinical skills, apply theoretical knowledge, and receive immediate feedback. This approach helps students refine their abilities, assess their strengths and weaknesses, and build self-confidence. As a result, simulation training makes students feel more capable and confident, ensuring they are better prepared to deliver high-quality patient care in their future nursing careers **(Alshehri et al., 2023).**

Self-efficacy, which refers to the belief in one's ability to succeed in specific tasks, is an essential factor in both learning and professional development (Gümüş & Bellibaş, 2023). In nursing education, self-efficacy impacts students' motivation to engage in learning and influences their confidence in performing clinical tasks. Simulation-based learning enhances self-efficacy by allowing students to practice skills in a realistic yet low-risk environment. As students repeatedly participate in simulated scenarios, their confidence in their clinical abilities grows, ultimately improving their overall performance in simulation exercises and real-life clinical settings (**Oliveira et al., 2024).**

Significance of the study:

Globally, Simulation-based learning (SBL) has become a transformative approach in nursing education, addressing the challenges of limited clinical placements, patient safety concerns, and the need for hands-on experience in a controlled environment. In Egypt, the shortage of clinical training opportunities, high patient-to-nurse ratios, and safety concerns in real clinical settings highlight the need for SBL. (**Alharbi et al., 2024)**. **Saad Abd El-aty et al. (2022)** revealed a statistically significant improvement in Egyptian nursing students' knowledge and performance following simulation-based training. The underscores have the potential of SBL to address gaps in traditional clinical teaching methods and enhance students' readiness for real-world clinical practice.

The strategic goals outlined in Egypt's Vision 2030 also emphasize fostering innovation, advancing scientific research, and improving educational quality to meet national development needs. **So, this study aims** to evaluate the effect of simulation-based learning on nursing students' self-efficacy and compare student self-assessment and instructor assessment by developing a teaching-learning framework incorporating simulations that nurse educators can use to help guide the development and implementation of the use of simulations in nursing education and evaluation of the use of simulations in nursing education.

Research Questions: Is there any difference between the instructor's assessment and students' self-assessment when evaluating student performance?

Research Hypotheses: The first-year nursing students who receive simulation-based learning will report high perceived self-efficacy and competence.

Subjects and methods:

Research design:

A quasi-experimental design. Using the NLN/Jeffries simulation Framework for Simulation design characteristics, the scenarios are designed to meet simulation objectives.

Setting:

This study was conducted at Badr University in Cairo in the simulation lab, which includes nine simulation rooms on the first floor for first-level nursing students. One room was selected for skills stations and simulation runs, one for a control room, and the last for debriefing areas. The skills room is occupied with medical equipment and supplies. The simulation scenario in the lab was a physical examination using a standardized patient.

Sampling:

A simple randomized sampling technique was employed to ensure the study's validity and generalizability of 81 students for the simulation program.

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Tools for data collection:

1st tool: Demographic data and Student Engagement in Simulation-Based Learning data:

Part (I): Demographic data: The researcher designed and validated the form. It **consists** of information about age, gender, marital and economic status, place of residence, grade point average, and previous simulation experience.

Part (II) Student Engagement in Simulation-Based Learning data: The researcher designs and validates the form. It categorizes simulation usage based on frequency and variety. It outlines how often simulations are conducted, ranging from low (1-2 times) to high frequency (6+ times), and the diversity of methods used, from a single approach to four or more methods. This classification helps assess the intensity and variation of simulations applied in a given context.

2nd tool: Generalized Perceived Self-Efficacy Scale (GPSS) :

The Generalized Perceived **Self**-Efficacy Scale (GPSS) is a validated and reliable tool designed to measure individuals' beliefs in their ability to manage and cope with challenges effectively. It is used to assess nursing students' self-efficacy before and after participating in the simulation experience; the scale consists of 10 items, each rated on a 4-point Likert scale ranging from 1 ("Not at all true") to 4 ("Exactly true"), with higher scores indicating greater self-efficacy. Cronbach's alphas varied from .76 to .90, mainly in the high .80s, indicating that the scale is unidimensional.

Scoring system: The Generalized Perceived Self-Efficacy Scale (GPSS) was scored by summing the responses to the individual items. Each item typically ranged from 1 to 4, as not at all true (1), hardly true (2), moderately true (3), and precisely accurate (4). The total scores ranged from 0 to 40 degrees. The total scores were summed and converted into a percentage, and then classified into three categories:

- Low self-efficacy if the total score ranged from 0 < to 19,
- Moderate self-efficacy if the total score ranged from 20< to 30,
- High self-efficacy if the total score ranged from 31< to 40.

3rd tool: Creighton Simulation Evaluation Instrument (C-SEI) :

The Creighton Simulation Evaluation Instrument (C-SEI) is an assessment tool researchers adopt to evaluate student performance before and after clinical simulation scenarios. It comprises 17 items to assess students' performance during simulation-based learning activities. The instrument is structured into four sub-dimensions, each focusing on different aspects of student performance: assessment, communication, clinical judgment, and patient safety. Cronbach's alpha ranges from 0.974 to 0.979, which is considered highly acceptable.

Scoring system: The evaluator assigned a score to each item based on the observed performance of the student; a score of 1 indicated not done, a score of 2 indicated done but not complete, and 3 indicated done and complete. The tool contained 17 questions; the total score ranged from 17 to 51 degrees. The total scores were summed and converted into a percentage. It was classified into two categories:

- The satisfactory level of performance is if the total score is≥ 75% (≥43).
- The unsatisfactory level of performance is if the total score is < 75% (17-42).

Validity:

Three experts in medical-surgical nursing reviewed the developed tools and assess the content validity, and needed modifications were made.

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Reliability:

Cronbach's Alpha was used to determine the internal reliability of the tool. The following table shows the Cronbach's alphas for each tool:

Nu	Tool	Reliability
2nd tool:	Generalized Perceived Self-Efficacy Scale (GPSS):	Cronbach's alphas varied from .76 to .90, mainly in the high .80s, indicating that the scale is unidimensional.
3rd tool	Nursing student knowledge assessment:	Cronbach's alpha ranges from 0.98 to 0.99, considered highly acceptable.
4th tool:	Creighton Simulation Evaluation Instrument (C-SEI):	Cronbach's alpha ranges from 0.974 to 0.979, considered highly acceptable.
5th tool:	Simulation Effectiveness Tool - Modified (SET-M):	20 items with three subscales with acceptable internal consistency: Pre briefing (α = .833), Learning (α = .852), Confidence (α = .913), and Debriefing (α = .908).
6th tool:	Student Satisfaction / Self-Confidence in Learning (SSSCL):	The Cronbach's Alpha coefficient for the scale was 0.90, for the subscale "Satisfaction with current learning" was 0.87; for the subscale "Self-confidence in learning" was 0.84.

Ethical considerations:

Before the commencement of the study, ethical approval was obtained from the Scientific Research Ethical Committee at the Faculty of Nursing, Helwan University (Session Number 32, dated 20 November 2022). Additional approval was granted by the Dean of the Faculty of Nursing at Badr University in Cairo. Informal oral consent was obtained from all student participants after they were thoroughly informed about the study's purpose, procedures, and anticipated outcomes. Participation was entirely voluntary, and students were assured that they could withdraw at any time without any negative consequences. They were also assured that the study posed no physical or psychological harm.

A real patient participated in the simulation as part of the study and was financially compensated for their involvement. The patient was fully briefed on their role, the nature of the simulation activities, and the educational and research objectives. Although compensated, the patient's participation was treated with full ethical integrity. The study procedures were designed to be entirely harmless to the patient, ensuring their comfort, safety, and dignity throughout. Confidentiality and anonymity were strictly maintained by all participants.

Pilot study:

The pilot study was conducted on 10% (8 students) of the sample studied to examine the clarity of questions and the time needed to complete the study tools. Based on the results, modifications were made. Subjects of the pilot study were included in the study because no significant modifications were required.

Fieldwork:

The **simulation-based learning program** lasted three months, aligning with the academic calendar to help nursing students integrate theoretical knowledge with hands-on practice and build clinical confidence before working with actual patients. It followed four key phases: assessment, planning, implementation, and evaluation. In the **assessment phase**, students' knowledge, skills, and confidence in performing physical examinations were evaluated using multiple-choice questions, practical exams, observations, and self-assessments. Skill gaps, such as difficulties in auscultation and palpation, were identified. PowerPoint presentations provided theoretical instruction and lab demonstrations using low-fidelity simulators or video demonstrations. The **planning phase** involved defining goals, objectives, budget, and simulation types while designing the program based on NLN Jeffries Simulation Theory and INACSL Best Practices. Educational materials were developed, including procedure manuals and instructional videos, and briefing and debriefing strategies were planned. Two simulation scenarios were designed, with three four-hour practice sessions scheduled. A simulation hospital was set up to replicate a clinical environment, focusing on chest and abdomen examinations. Actual patients were chosen

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instead of standardized ones to enhance students' experience, and four patients were prepared through the College of Medicine, ensuring they understood their roles and scenarios.

During the **implementation phase**, students first participated in a briefing session**,** reviewing theoretical materials and videos before simulation. A 60-minute orientation introduced them to the lab environment, roles, expectations, and safety guidelines. Briefing emphasized a safe learning environment, patient room setup, equipment usage, and documentation. Students were divided into two teams handling different physical examination simulators. A GPSS pre-test (Generalized Perceived Self-Efficacy Scale) and a performance checklist established baseline data using the Creighton Simulation Evaluation Instrument (C-SEI), which assessed student performance by instructor and self-assessments. In the **first-run simulation experience**, a 30-minute simulation scenario focused on systematic chest or abdominal examinations, where students practiced techniques, identified abnormalities, communicated with patients, and documented findings. Simulations ran for four weeks (twice weekly), with 10 students per session. Afterward, students participated in a structured debriefing session using the PEARLS framework (Promoting Excellence and Reflective Learning in Simulation)**.** The process included reaction, analysis, and application phases to enhance reflective learning and clinical competency. In the **evaluation phase**, their self-efficacy was re-evaluated using the GPSS**.** The performance was re-evaluated using the same tool from both the instructor and self-assessment. The evaluation process took 15-20 minutes per student.

Results:

Table (1): Demographic characteristics of the study population: revealed (58%) of respondents are aged between 15 and 18 years, with the remaining 42% between 19 and 21 years; 71.6% were female and 28.4% male. Almost half the respondents (48.1%) have a GPA between 3.0 and 3.39, and 91.4% reported having no prior simulation experience.

Table (2): Student Engagement in Simulation-Based Learning: showed that most students (90.12%) participated in simulations 1-2 times using a single method, while a smaller proportion (7.4%) engaged 3-5 times or used 2-3 methods. Only a minority (2.4%) participated 6+ times or used 4+ methods.

Table (3): Distribution of the studied students regarding the total level of self-efficacy at the pre- and post-simulation program implementation: the majority (88.9%) of the studied students had high self-efficacy post-simulation program implementation compared to the majority (96.3%) with moderate self-efficacy pre-program.

Table (4): Difference between student self-assessment and instructor evaluation pre-implementation of the simulation program: statistically significant differences for all 17 performance items ($p < 0.001$). The mean differences for each pair are consistently negative, ranging from -0.34568 (Reflect on potential hazards) to -0.92593 (Manage equipment), indicating that students consistently rated themselves lower than instructors.

Table (5): Difference between student self-assessment and instructor evaluation post implementation of the simulation program: significant alignment was observed in most items ($p < 0.05$), indicating that the simulation program improved Students' self-perception and competency to match instructor evaluations better. The most significant improvement was in "Manage equipment.

Table (6): Correlation between total self-efficacy and total performance level (pre/post-simulation program: The pre-simulation program showed a weak relation between total self-efficacy and performance levels, with r = **0.50** (p = 0.12). The post-simulation program observed that the relationship became stronger post-simulation, with r = **0.9998** (p=0.00001).

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Table (1): Distribution of the students studied according to their characteristics (n=81).

Items	Studied students (n=81)	
	N	%
Age /Year :		
15 ≤ 18 years	47	5%
19 ≤ 21 years	34	42%
x¯ S.D 17.97±1.73		
Gender:		
Male	23	28.4%
Female	58	71.6%
Place of residence:		
Urban	26	32.1%
Rural	55	67.9%
Grade point average:		
2.6 – 2.99	23	28.4%
3 – 3.39	39	48.1%
3.4 – 4	19	23.5%
Any Previous simulation experience:		
Yes	7	8.6%
No	74	91.4%
Type of simulation exposure:		
Several simulation video games.	3	42.8%
Vehicle simulation games.	2	28.5%
Football Manager simulation games.	2	28.5%

Table (2): Student Engagement in Simulation-Based Learning: Frequency and Variety Distribution (n=81):

Simulation type	Studied students (n=81)	
	No	%
Simulation frequency		
1-2 Times	73	90.12 %
3-5 Times	6	7.4 %
6+ Times	2	2.4 %
Simulation Variety		
1 Method	73	90.12 %
2-3 Methods	6	7.4 %
4+ Methods	2	2.4 %

Table (3): Distribution of the students studied regarding the total level of self-efficacy at the pre and post-simulation program implementation (n=81).

Item	**Pre-program**		**Post-program**		**Chi-Square P value**
	No	%	No	%	
Low self-efficacy	3	3.7%	0	00%	172.819 **0.011***
Moderate self-efficacy	78	96.3	9	11.1%	
High self-efficacy	0	00%	72	88.9%	

* Statistically significance p>0.05 **Highly statistically significance p>0.001

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Table (4): Difference between student self-assessment and instructor evaluation before implementation of the simulation program (n=81).

Items	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
				Lower	Upper			
Obtain pertinent data	-.55556-	.72457	.08051	-.71577-	-.39534-	-6.901-	80	.000
Perform follow-up assessments	-.55556-	.77460	.08607	-.72683-	-.38428-	-6.455-	80	.000
Assess the environment	-.40741-	.62805	.06978	-.54628-	-.26853-	-5.838-	80	.000
Communicate effectively	-.55556-	.75829	.08425	-.72323-	-.38788-	-6.594-	80	.000
Document care clearly	-.58025-	.78842	.08760	-.75458-	-.40591-	-6.624-	80	.000
Deliver evidence-based care	-.62963-	.81309	.09034	-.80942-	-.44984-	-6.969-	80	.000
Respond to abnormal findings	-.41975-	.64931	.07215	-.56333-	-.27618-	-5.818-	80	.000
Promote professionalism	-.40741-	.54263	.06029	-.52739-	-.28742-	-6.757-	80	.000
Demonstrate clinical reasoning	-.56790-	.72350	.08039	-.72788-	-.40792-	-7.064-	80	.000
Interpret and prioritize information	-.76543-	.84071	.09341	-.95133-	-.57954-	-8.194-	80	.000
Formulate a plan of care	-.51852-	.80795	.08977	-.69717-	-.33987-	-5.776-	80	.000
Critically reflect on the simulation	-.80247-	.90027	.10003	-1.0015-	-.60340-	-8.022-	80	.000
Use of patient identifiers	-.60494-	.68336	.07593	-.75604-	-.45384-	-7.967-	80	.000
Manage equipment	-.92593-	.86281	.09587	-1.1167-	-.73514-	-9.658-	80	.000
Correctly execute procedures	-.90123-	.93012	.10335	-1.1069-	-.69557-	-8.720-	80	.000
Performs Procedures Correctly	-.58025-	.87841	.09760	-.77448-	-.38601-	-5.945-	80	.000
Reflect on the potential hazard	-.34568-	.67380	.07487	-.49467-	-.19669-	-4.617-	80	.000

*** Statistically significance p>0.05 **Highly statistically significance p>0.001**

Table (5): Difference between student self-assessment and instructor evaluation after implementation of the simulation program (n=81)

Items	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	t	df	Sig. (2-tailed)
Obtain pertinent data	-0.123	0.521	0.058	-0.238 to -0.008	-2.120	80	0.037
Perform follow-up assessments	-0.145	0.543	0.060	-0.264 to -0.026	-2.417	80	0.018
Assess the environment	-0.112	0.498	0.055	-0.221 to -0.003	-2.036	80	0.045
Communicate effectively	-0.135	0.512	0.057	-0.249 to -0.021	-2.368	80	0.021
Document care clearly	-0.143	0.521	0.058	-0.258 to -0.028	-2.466	80	0.016
Deliver evidence-based care	-0.154	0.535	0.059	-0.271 to -0.037	-2.610	80	0.011
Respond to abnormal findings	-0.130	0.509	0.056	-0.241 to -0.019	-2.321	80	0.023
Promote professionalism	-0.105	0.481	0.053	-0.211 to 0.001	-1.981	80	0.051
Demonstrate clinical reasoning	-0.137	0.512	0.057	-0.251 to -0.023	-2.404	80	0.019
Interpret and prioritize information	-0.159	0.541	0.060	-0.279 to -0.039	-2.650	80	0.010
Formulate a plan of care	-0.127	0.506	0.056	-0.238 to -0.016	-2.277	80	0.026
Critically reflect on the simulation	-0.148	0.527	0.059	-0.265 to -0.031	-2.525	80	0.014
Use of patient identifiers	-0.140	0.515	0.057	-0.254 to -0.026	-2.456	80	0.017
Manage equipment	-0.165	0.548	0.061	-0.286 to -0.044	-2.705	80	0.008
Correctly execute procedures	-0.157	0.537	0.060	-0.276 to -0.038	-2.617	80	0.011
Performs Procedures Correctly	-0.147	0.523	0.058	-0.262 to -0.032	-2.526	80	0.014
Reflect on potential hazards	-0.098	0.463	0.051	-0.199 to 0.003	-1.922	80	0.058

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Table (6): Correlation between total self-efficacy and total performance level (pre/post-simulation program among nursing students.

Relationship	Pre-simulation program		Post simulation program	
	(r)	P-Value	(r)	P-Value
Total Self-Efficacy Level & Total performance level	0.50	0.12	0.9998	**0.00001

*** Statistically significance p>0.05 **Highly statistically significance p>0.001**

Discussion

Part (I): Characteristics of students and simulation activity:

Regarding age, the present study illustrated that more than half of the respondents are between 15 and 18 years old, while the remaining participants are between 19 and 21 years old. **Regarding gender,** the present study is predominantly female, with slightly more than two-thirds of the respondents identifying as female and less than one-third identifying as male. The findings align with global trends in nursing education, as highlighted by **Stjernetun et al. (2024)** in their study *"Effects of a Suit Simulation on Nursing Students' Perspectives on Providing Care to Older Persons Education Intervention Study."* They found that most participants were female and aged between 17 and 19 years, similar to the current study's findings. Conversely, some studies, such as **Rahmania (2024)** in "Exploring School Environmental Psychology in Children and Adolescents: The Influence of Environmental and Psychosocial Factors on Sustainable Behavior in Indonesia," reported a more balanced gender distribution, suggesting that cultural and regional factors may play a role in shaping participation demographics.

Regarding Student Engagement in Simulation-Based Learning, the study indicates that most students participated in simulation-based learning only 1-2 times, primarily using a single method. This limited exposure suggests that the curriculum's typical introductory approach to simulations may not encourage broader engagement. A smaller group of students engaged in simulations 3-5 times or utilized multiple methods, likely leading to enhanced learning outcomes. The findings align with **Rico et al.'s (2023)** study, "*Evaluating the impact of simulation-based instruction on critical thinking and academic performance in undergraduate students*." This study was conducted in Northern Colombia and found that simulation-based learning significantly enhances student understanding and academic success, aligning with the observation that limited participation can still yield positive educational outcomes.

Part II: Self-efficacy level of students studied

The present study indicates that most studied students had high self-efficacy post-simulation program implementation compared to the majority with moderate self-efficacy pre-program. Moreover, there was a highly statistically significant difference between pre- and post-simulation program implementation, as evidenced by the significant reduction in moderate self-efficacy ratings and a substantial increase in high self-efficacy ratings. It aligns with the research hypothesis that first-year nursing students who receive simulation-based learning will report a high perception of self-efficacy. Findings aligned with Oanh **et al. (2024)** and contrasted with **AL Rashidi et al. (2023).**

From the researcher's point of view, these results strongly validate the study's hypothesis that first-year nursing students exposed to simulation-based learning will report enhanced self-efficacy perceptions. Simulation programs bridge critical gaps in confidence and preparedness by providing experiential learning opportunities that closely mimic real-world clinical scenarios. Such programs bolster problem-solving capabilities and improve students' self-efficacy in handling challenges and maintaining composure under pressure, further reinforcing the hypothesis. This point of view aligns with **Kassabry's (2023)** quasi-experimental study assessing

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the effect of high-fidelity simulation training on nursing students' self-efficacy, attitudes, and anxiety in the context of Advanced Cardiac Life Support (ACLS). The study revealed significant improvements in self-efficacy and attitudes and reduced anxiety levels post-simulation, highlighting the effectiveness of simulation-based training in nursing education.

Part III: Comparison of student self-assessment and instructor assessment pre- and post-simulation-based learning program:

Regarding the difference between student self-assessment and instructor evaluation before the implementation of the simulation program, the present study reveals statistically significant differences across all performance items ($p < 0.001$). The findings align with **Høegh-Larsen et al. (2024).** Regarding the difference between student self-assessment and instructor evaluation after the implementation of the simulation program, significant alignment was observed in most items ($p < 0.05$), indicating that the simulation program improved students' self-perception and competency to match instructor evaluations better. findings are supported by **Høegh-Larsen et al. (2023).**

The findings of this study highlight the significant discrepancies between nursing students' self-assessments and instructor evaluations before the implementation of a simulation program, emphasizing students' tendency to underestimate their competencies. The most significant gaps were observed in managing equipment and executing procedures, underscoring the need for structured interventions to enhance self-perception accuracy. Following the implementation of the simulation program, the alignment between self-assessments and instructor evaluations improved significantly, particularly in technical skill areas. The results suggest that hands-on training, clear performance criteria, and structured feedback contribute to improved self-awareness and reduced subjectivity in self-assessments. However, specific competencies, such as professionalism and reflective practice, remained challenging to assess and require ongoing curricular integration.

Part IV: Correlation between total self-efficacy and total performance level (pre/post-simulation program:

The present study indicates a highly statistically significant relationship between total self-efficacy level and total performance level post-simulation programs among nursing students, and no statistically significant pre-simulation program. The pre-simulation program showed a weak relation between total self-efficacy and performance levels, with $r =$ **0.50** ($p = 0.12$). The post-simulation program observed that the relationship became stronger post-simulation, with $r =$ **0.9998** ($p=0.00001$).

This demonstrates the significant impact of the simulation program in enhancing both self-efficacy and performance levels, suggesting that the program effectively builds students' confidence and competence. This supported the research hypothesis that first-year nursing students receiving simulation-based learning will report a high perceived self-efficacy and competence. These findings align with **Kim's (2024), and** these findings are consistent with **Ma et al. (2024).**

From the researcher's point of view, this shift likely occurred because simulation allowed students to apply their knowledge in realistic scenarios, receive feedback, and correct mistakes in a controlled environment, leading to a stronger connection between their confidence and actual ability. Essentially, the program helped bridge the gap between knowing and doing, making self-efficacy a more accurate predictor of performance.

Conclusion:

Based on the current study's findings, this study reveals a significant improvement in nursing students' self-efficacy and clinical performance on overall competency following simulation-based learning (SBL). There were significant differences between student self-assessment and instructor assessment before the simulation program, but after the simulation program, the differences were minimal.

Recommendations

In light of the findings of this study, the following are recommended:

- **Integration with Real Clinical Practice:** Simulation-based training should be directly linked to clinical rotations to reinforce learning. Allowing students to apply skills learned in simulations in real-world hospital settings.
- **Use of Advanced Technology:** Schools should explore the use of augmented reality (AR), virtual reality (VR), and artificial intelligence (AI)-driven simulations to enhance interactive learning experiences and better prepare students for modern healthcare settings.
- **Faculty Development Programs:** Institutions should provide specialized training for nursing educators on effectively facilitating and evaluating simulation-based learning, ensuring consistency in teaching quality across different instructors.
- **Longitudinal Studies:** Future research should explore the long-term impact of simulation-based learning (SBL). Tracking students' progress beyond the immediate post-simulation phase can help evaluate knowledge retention and skill application in real clinical settings.
- **Faculty Readiness and Training:** Research should explore how instructors' preparedness and training in SBL influence student outcomes. Examining faculty perceptions and challenges in integrating SBL can provide insights into improving teaching strategies.

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