Design and Impact of 'Room of Errors' Simulation Training to Improve Patient Safety Skills in Nursing Students

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Introduction

Patient safety is a fundamental concern in nursing education, yet clinical environments offer limited opportunities for students to recognize and respond to safety risks. Situation awareness—the ability to detect and interpret potential hazards—is essential for preventing medical errors, which remain a leading cause of harm globally.

Simulation-based learning, particularly the "Room of Errors (ROE)" model, has emerged as a promising approach for enhancing patient safety competencies. ROE activities engage students in identifying pre-set errors in realistic scenarios, fostering critical thinking, teamwork, and hazard recognition. Despite growing interest, few studies provide concrete guidance on implementation.

This study aims to design and evaluate a ROE simulation program tailored for nursing students, offering foundational data to support the integration of simulation into safety education.
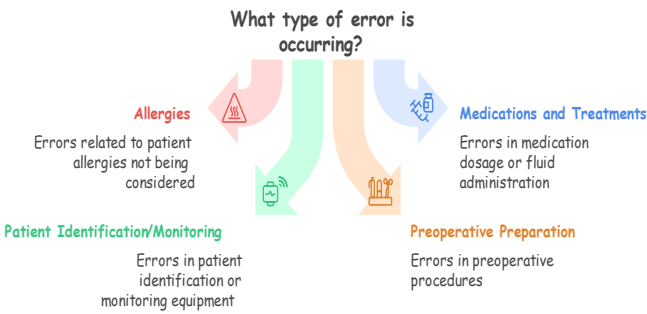

Methods

This one-group pretest-posttest study evaluated a simulation-based "Room of Errors (ROE)" program developed using the ADDIE model. Participants were 51 third-year nursing students from a single university who had completed relevant theory and clinical prerequisites.

The intervention simulated a preoperative care scenario for an appendectomy patient, embedding 25 safety hazards. Students identified errors during the simulation and participated in structured debriefing sessions. Measures included general characteristics, patient safety confidence (H-PEPSS), error identification checklist, and program satisfaction.

Data were analyzed using descriptive statistics and paired t-tests. Qualitative feedback was thematically summarized to assess educational impact.

What type of error is occurring?

Allergies — Errors related to patient allergies not being considered

Medications and Treatments — Errors in medication dosage or fluid administration

Patient Identification/Monitoring — Errors in patient identification or monitoring equipment

Preoperative Preparation — Errors in preoperative procedures

Results & Conclusion

Student-identified errors

	Instructor-set hazards	n(%)
1	Side rail is down	47(92.2)
2	The patient bracelet has a mismatched registration number and name.	45(88.2)
3	The urine bag clamp is locked.	45(88.2)
4	Needles left on the bed	44(86.3)
5	Latex gloves should not be used around the bed for a patient with a latex allergy.	44(86.3)
6	Fluids prescribed for another patient	44(86.3)
7	SpO_2 application location error	43(84.3)
8	EKG lead attachment location error	41(80.4)
9	The patient is wearing socks before surgery.	41(80.4)
10	Incorrect oxygen dosage	39(76.5)
11	Prepared ampoule medication dosage error	39(76.5)
12	Water pooling on the floor	38(74.5)
13	Fluid was not infused due to incorrect orientation of the 3-way valve.	27(52.9)
14	Fluid expired (error label)	23(45.1)
15	Aspirin allergy was not taken into account, and medication was prescribed.	20(39.2)
16	Incorrect surgical site marking	17(33.3)
17	OP permission not available	17(33.3)
18	The needle container is full.	13(25.5)
19	The urine bag line is located between the side rails.	11(21.6)
20	Fluid infusion rate error (dosi-flow error)	10(19.6)
21	A 24G needle was inserted when an 18G needle should have been used preoperatively.	9(17.6)
22	Used alcohol swabs were left on the bed	3(5.9)
23	Foley urinary drainage bag is touching the ground.	3(5.9)
24	The O_2 bottle is not filled with distilled water.	1(2.0)
25	The bed wheels are not locking.	0(0.0)

Items(H-PEPSS)	pre-test M±SD	post-test M±SD	t	p
Total	**3.62±.54**	**4.19±.60**	**-5.35**	**<.001**
Teamwork with other health professionals	3.76±.61	4.22±.62	-5.20	<.001
Communicating effectively	3.72±.67	4.27±.61	-3.99	<.001
Managing safety risk	3.73±.67	4.27±.61	-4.47	<.001
Understanding environmental factors	3.48±.72	4.13±.62	-4.85	<.001
Recognise and respond to reduce harm	3.70±.60	4.22±.66	-4.71	<.001
Culture of safety	3.73±.67	4.27±.61	-4.30	<.001

The ROE simulation program significantly enhanced nursing students' confidence in patient safety, with satisfaction scores nearing the maximum. Participants reported heightened awareness, vigilance, and readiness to prevent errors. These findings support the integration of ROE-based training into nursing curricula and clinical education to strengthen future healthcare providers' competencies in patient safety.