A Novel Approach to Patient Safety Education: Integrating HFACS to Build a Culture of Safety in Medical Training


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Background

- Patient safety is essential but current curricula lack focus on systemic and human factors.
- HFACS (Human Factors Analysis and Classification System) categorizes errors into: Unsafe Acts, Preconditions, Supervision, Organization
- This study tested an HFACS-based workshop to strengthen safety competencies in medical students.

Methods

- Design: Pre- & post-test study.
- Participants: 30 senior medical students (Taiwan).
- Intervention: 90-min HFACS workshop (safety principles, error reporting, case analysis).
- Assessment: Questionnaire + video scenario; analyzed recognition of adverse events & human factors.

Conclusion

- HFACS-based education significantly enhances:
  - Recognition of reportable adverse events.
  - Systematic identification of human factors.
- Embedding HFACS in medical curricula fosters:
  - Systems thinking
  - Error prevention skills
  - A stronger safety culture
- Future directions: emphasize organizational-level issues, continuous education, interprofessional training.

Results

- Adverse Event Recognition:
  from 77.0% → 94.0% (p = 0.005).
- Recognition of the Importance of Reporting
  from 68.6% → 80.5% (p = 0.016).
- Human Factors Identified:
  from 5.5 → 34.9 (p < 0.001).
  Significant improvement across all HFACS levels.

Table 1: Recognition of Human Factors

HFACS Categories	Pre-test Mean (SD) (n=30)	Post-test Mean (SD) (n=30)	*p*	95% Confidence Interval	
				Lower Bound	Upper Bound
Total	5.5 (2.4)	36.7 (14.1)	<0.001	2.1	25.6
Level 1：Unsafe Acts	2.6 (0.8)	11.1 (3.4)	<0.001	2.4	7.2
Level 2：Preconditions for Unsafe Acts	2.1(1.1)	15.3 (5.5)	<0.001	2.2	11.0
Level 3：Supervisory Factors	0.6 (0.6)	6.0 (2.9)	<0.001	2.0	4.4
Level 4：Organizational influences	0.3 (0.8)	4.2 (3.4)	<0.001	1.1	2.6

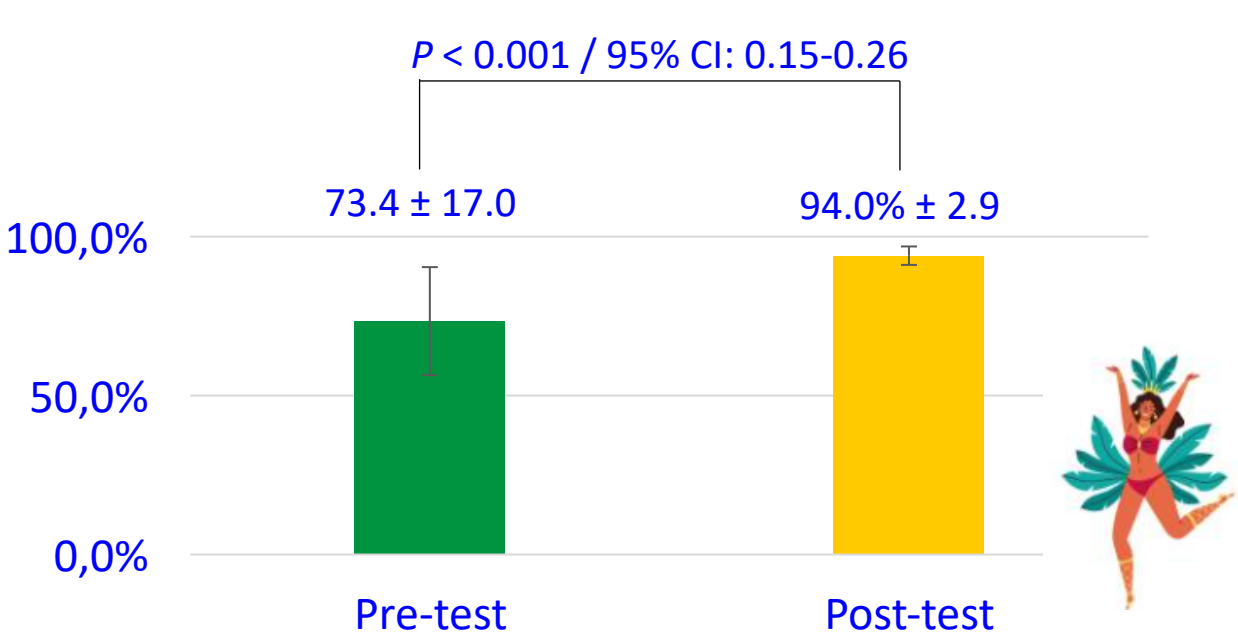

Figure 1: Recognition of reportable adverse events

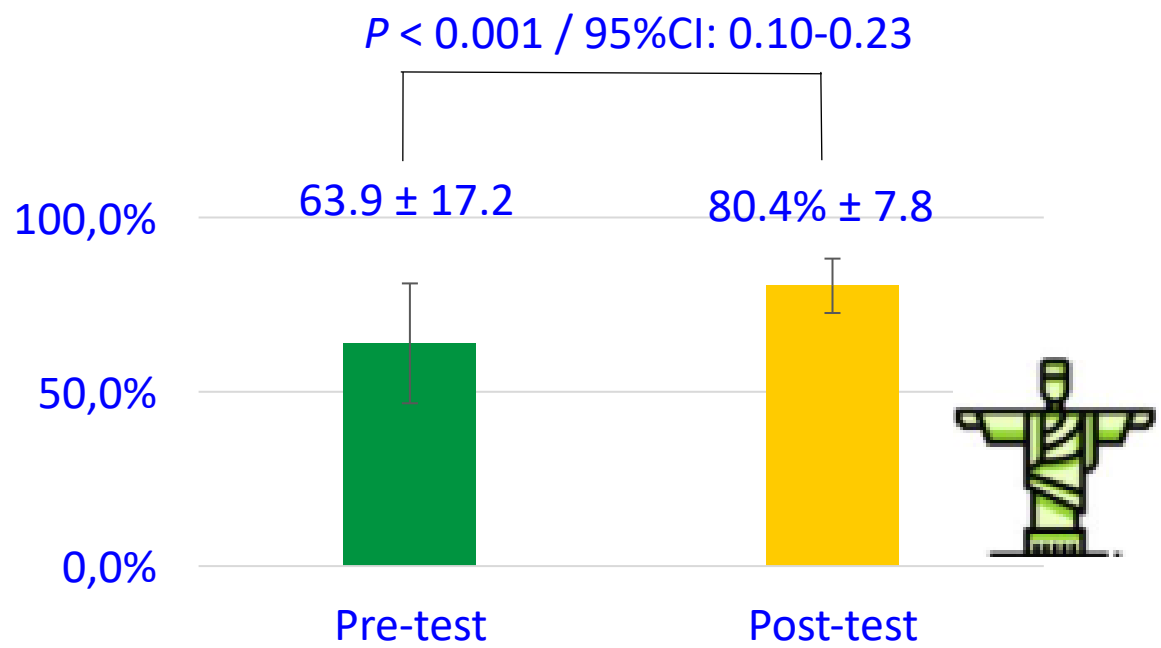

Figure 2: Recognition of the Importance of Reporting