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Comparing Scenario-Based Simulation Education to Escape Room Simulation Education with Emergency Medicine Residents

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Authors

Bethel, Aubrey

Dimeo, Sara

Ng, Vivienne

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Methods: This was a retrospective observational study at a tertiary urban academic Level I trauma center from 2017 to 2021 with a 3-year emergency medicine residency of 10 to 12 residents per year and annual volumes of 80,000 to 101,000. Boarding was defined as the time between an admission order and the patient leaving the ED. A multivariable mixed model was created with fixed covariates for year, month, day of week, resident experience (total month in residency), shift duration, total daily ED patients, and with residents as repeated measures. The effect of boarding was estimated after covarying out all other factors.

Results: All variables included in the model were significantly associated with changes in productivity (Table 1). Resident experience has the largest effect such that for each month of residency experience, a resident adds 0.012 patients per hour (95%CI 0.010-0.014). Isolating the effect of boarding demonstrated that for every additional 100 hours of boarding,

Table 1. Multiple regression results predicting new patients per hour per resident for each variable.

Effect	Estimated New Patients per Hour	Standard Error	95% CI
Intercept	1.0957	0.0173	1.0616 to 1.1297
Year			
2017	0.1501	0.0122	0.1262 to 0.1740
2018	0.0837	0.0117	0.0606 to 0.1065
2019	[reference]		
2020	-0.0641	0.0137	-0.0909 to -0.0373
2021	-0.1682	0.0156	-0.1987 to -0.1377
Month			
1	0.0635	0.0172	0.0296 to 0.0972
2	0.0776	0.0182	0.0420 to 0.1133
3	0.0498	0.0181	0.0144 to 0.0852
4	0.0840	0.0197	0.0453 to 0.1227
5	0.0750	0.0196	0.0366 to 0.1133
6	0.0585	0.0201	0.0191 to 0.0979
7	-0.0077	0.0219	-0.0507 to 0.0353
8	0.0550	0.0185	0.0188 to 0.0912
9	0.0654	0.0187	0.0288 to 0.1021
10	0.0487	0.0184	0.0127 to 0.0847
11	0.0486	0.0199	0.0095 to 0.0876
12	[reference]		
Day of the Week			
Sunday	0.0587	0.0118	0.0357 to 0.0818
Monday	-0.0312	0.0118	-0.0542 to -0.0082
Tuesday	0.0122	0.0110	-0.0094 to 0.0338
Wednesday	0.1094	0.0123	0.0854 to 0.1334
Thursday	[reference]		
Friday	0.0475	0.0109	0.0261 to 0.0688
Saturday	0.1182	0.0120	0.0946 to 0.1417
Resident months (linear) *	0.0122	0.0010	0.0101 to 0.0142
(quadratic)	-0.0011	0.0000	-0.0012 to -0.0010
(cubic)	0.00003	0.00001	0.00002 to 0.00004
Total Patients Per Day (per 100 patients) *	0.4021	0.0165	0.3697 to 0.4344
Shift duration*	-0.1277	0.0070	-0.1413 to -0.1140
Boarded (per 100 hours) *	-0.0218	0.0032	-0.0280 to -0.0156

The mixed-model also included resident as a repeated-effect with an AR(1) covariance structure.
* Continuous covariates were referenced to the median value. Median resident month=18, total patients per day/100=1.77, shift duration=10 hours, boarded hours/100=2.61

a resident's productivity decreases by 0.022 patients per hour (95%CI 0.016-0.028). In the study the median daily boarding was 261 hours, and if this were eliminated

(assuming a resident completes 100, 10-hour shifts annually), a resident could be expected to see 57.4 more patients a year (95%CI 41.8-73.1).

Conclusions: All factors had a significant impact on resident productivity with boarding having a negative impact. Further study is warranted to understand how to mitigate any educational impact.

5 Comparing Scenario-Based Simulation Education to Escape Room Simulation Education with Emergency Medicine Residents

Aubrey Bethel, Sara Dimeo, Vivienne Ng

Background: Gamified education is a modality being incorporated into medical education. Educators have utilized escape room simulation to teach medical concepts in the sim environment by modifying clinical scenarios into clues and activities. No reported study compares the efficacy of escape room simulation (ERS) to scenario-based simulation (SBS) education when teaching medical concepts.

Objectives: We compare SBS to ERS education, hypothesizing that ERS teaches the same medical concepts compared to traditional SBS, while reducing anxiety.

Methods: This is a randomized controlled trial of emergency medicine (EM) residents in a single institution with no exclusion criteria. A peer-reviewed pediatric EM case was modified into a SBS and ERS. Subjects were consented and randomized to the two groups. Primary outcome: acquisition of medical concepts encountered in the sim case, assessed by improvement on a pre- and post-sim quiz. To prevent topic anticipation, the quiz had 15 questions, of which 5 related to the case. Secondary outcome: pre- and post-sim self-reported anxiety levels measured on a 100-point visual analog scale (VAS). Descriptive data and difference of means by two-tailed t test are reported.

Results: 40 residents (of 80 eligible) were enrolled with no loss to follow up. 21 subjects were randomized to SBS and 19 to ERS. Both groups showed improvement on the post-sim quiz, with SBS scores increasing from 73% to 80% (p= 0.016) and ERS from 71% to 79% (p=0.004). There was no statistical difference between the two groups (P=0.665). SBS anxiety levels slightly increased (VAS 50.7 to 52.4) compared to decreased ERS anxiety levels (VAS 52.1 to 31.1), statistically significant at p=0.002.

Conclusions: When comparing SBS to ERS, knowledge acquisition was achieved. Anxiety levels were lower in ERS subjects compared to SBS subjects. Limitations include small sample size and self-report. ERS can teach concepts while improving anxiety in the sim environment.
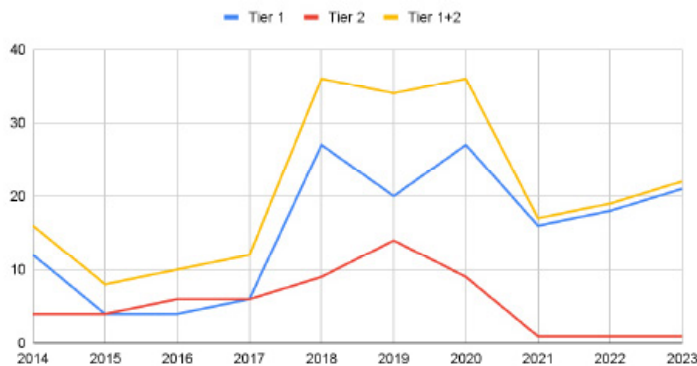
Figure 1. Research projects by tier 2014-2023.

6 Optimizing Scholarly Impact: Implementing the Scholarly Oversight Committee for Elevated Resident Output

Megan Wudkewych, Danielle Turner-Lawrence, Brett Todd

Background/Objectives: Providing an organized approach to resident scholarship is imperative to fostering academic development of residents, cultivating skills for lifelong learning, and contributing to medical knowledge. However, there is no standardized method for oversight and advancement of resident research and scholarship. We aim to introduce a strategy for residency programs to oversee and elevate EM resident scholarship.

Curricular Design: Recognizing the necessity for an organized system to enhance scholarly output, we created a Scholarly Oversight Committee (SOC). The SOC consists of a committee leader, director of EM research, and supporting faculty, who oversee research projects through quarterly meetings. These sessions involve reviewing project progress, identifying potential roadblocks, and providing targeted feedback. The SOC intervenes when residents face challenges in meeting benchmarks, conducts structured meetings with faculty advisors, and formulates tiered guidelines to assure all projects meet minimum standards. The success of the program depends on actively involved faculty, regular updates, and the establishment of clearly defined tiers. Initially, project tracking presented a challenge, leading to the creation of a dynamic living spreadsheet in response, as well as the initiation of a research forum to support a culture of scholarship.

Impact: The success of this innovation was primarily gauged by monitoring the rise in higher-level scholarly output standardized by the tiers and the increase in national or regional presentations. This has led to an overall improvement in the quality of scholarly projects, with a 237% surge in the number of projects published or presented at national or regional conferences per year despite the impact of the pandemic in 2021 (see graph 1). In conclusion, the SOC model, when combined

with interested faculty, class-based deadlines, and tiered guidelines, holds the potential for applicability in many programs.
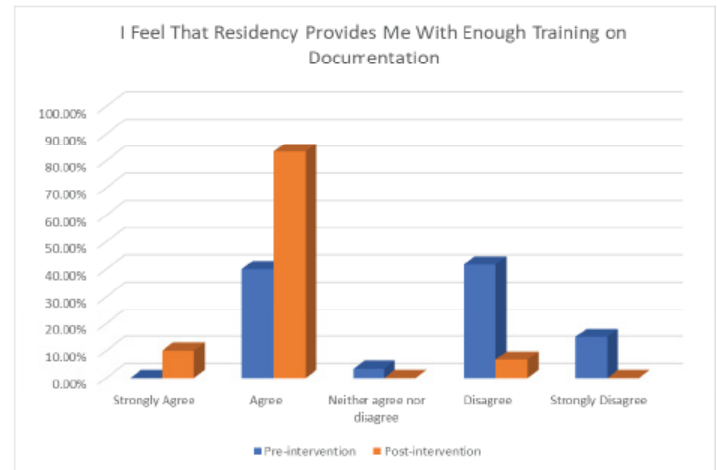

Figure 1. Residents were given 6 question needs assessment survey before and after documentation course. Followng the course, 90% of residents felt they had adequate training on documentation.
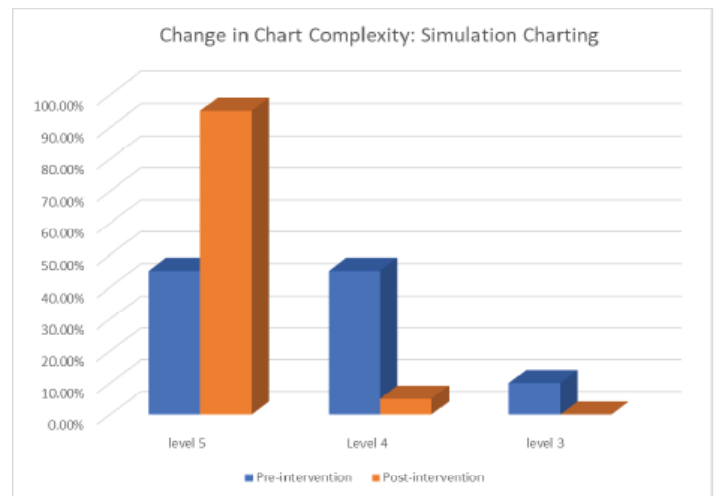

Figure 2. Residents participated in a simulated encounter of a highly complex case and were tasked with documenting to the appropriate coding level, which was a level 5 for both simulations. Prior to the course over 50% of the charts were downcoded from a level 5 to a level 4 compared to only 5% after completion of the course.

7 Enhancing Documentation in Emergency Medicine Resident Education Through Didactics and Simulation: Curriculum Development and Assessment

Jacqueline Dash, Jeremiah Ojha, Michael Buxbaum

Introduction/Background: Accurately documenting patient encounters is a fundamental skill that underpins the