Does Simulation Training Improve Resident Performance? A Reproducible Approach to Improving Residency Education

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INTRODUCTION

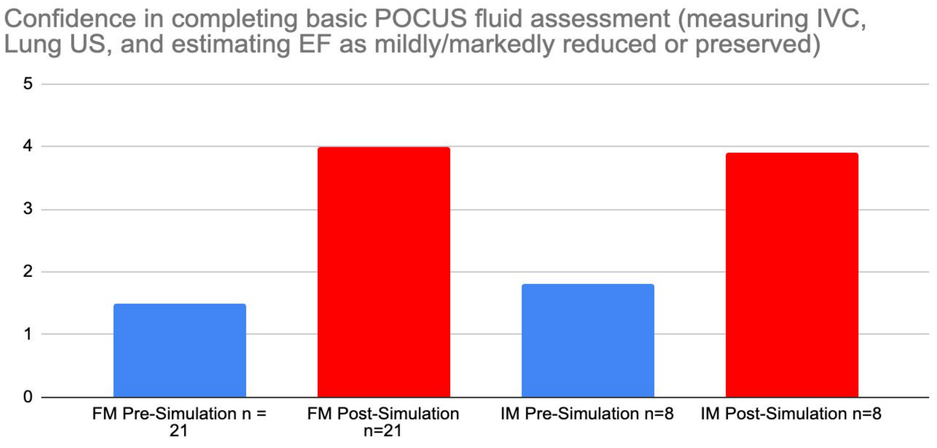
- Residency education has drastically changed over the years in response to multiple factors including the pandemic, changes in duty hour regulations, patient demographics, advancements in EMR, and the constantly expanding database of medical knowledge.
- One of the hidden sequelae of work hour reduction was the subsequent decrease in the average number of patient encounters per resident.
- This reduction in patient encounters directly decreased the opportunities for learning and practicing the skills required for responsible and safe patient care. This led to, at times, random chance dictating how many exposures a resident will obtain for certain procedures and clinical scenarios.
- In 2020 we created and implemented a simulation curriculum for the St. Vincent's Family Medicine Residency Program as a novel approach to residency education. This has continued longitudinally at SVFM while also being expanded to University of Florida IM Residency at Sacred Heart in Pensacola, Florida.
- This poster is an update, with three years of following multiple family medicine cohorts and two years of following one internal medicine cohort.

METHODS

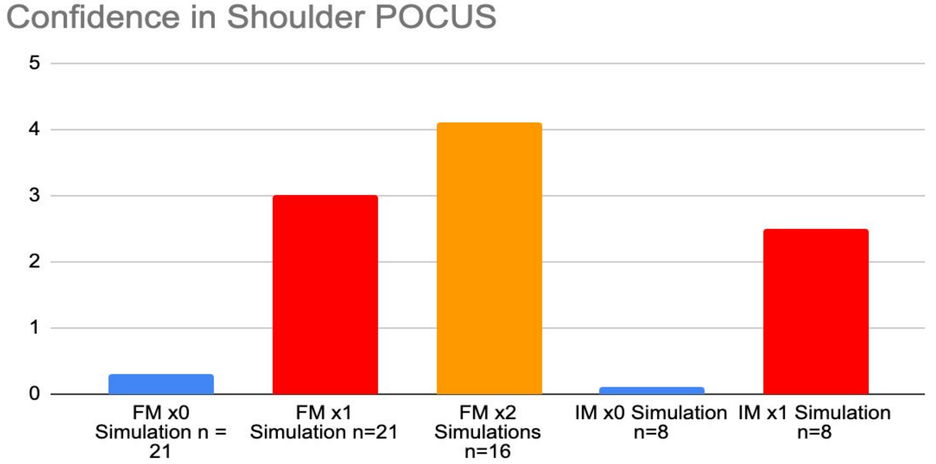
- We developed a simulation curriculum based on the common procedures and clinical scenarios that FM and IM residents are expected to be able to perform upon graduation.
- We evaluated residents via the Likert 5-point confidence scale survey that was completed at the beginning and end of the academic year. We have now completed five academic years across two primary specialties.
- In the procedural simulations we covered the indications & contraindications, supplies needed, manual techniques, pathophysiology, and sequelae.
- In the clinical scenario simulations, we emphasized: history taking, physical exam skills, assessment and decision making; along with a pathophysiology review at the end of the case to discuss the given clinical scenario.

Simulation Curriculum Syllabus:
Dermatology: Biopsies: shave, punch, excisional. Laceration repair: simple, intermediate, complex. Toenail removal w/ digital block.
Sports Medicine: Knee & shoulder injections via palpation and US guided.
Obstetrics: Hypertension of pregnancy, preeclampsia, delivery of shoulder dystocia, postpartum hemorrhage, and vaginal laceration repair.
Gynecology: Endometrial biopsy, IUD placement, and colposcopy.
POCUS: Basics of cardiac, IVC, lung, shoulder, & median nerve.
Pediatrics: Simulation of UTI, syncope, nausea/vomiting, early onset diabetes, respiratory distress (asthma exacerbation).
Inpatient medicine: Patient simulations covering chest pain, respiratory distress, HFrEF, sepsis, status epilepticus, GI bleed (upper & lower), and mock codes.
(IM residency did not complete OB/GYN or peds simulations)

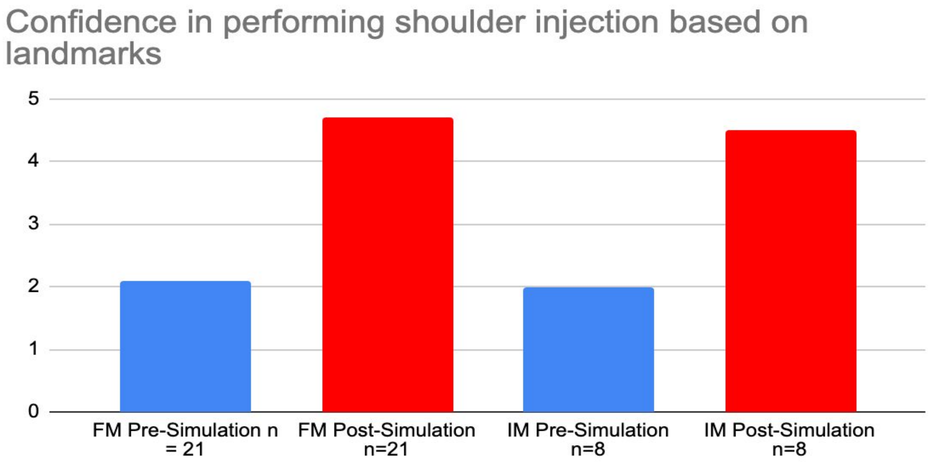
RESULTS



Comparing no simulation :vs: those that completed the simulations once



Comparing across x0, x1, x2 Simulations



Comparing no simulation :vs: those that completed the simulations once

DISCUSSION

- Overall, there is a positive trend across all simulations when comparing no simulation to at least one simulation. This holds true across both residencies which shows the reproducible nature of this simulation curriculum.
- What is encouraging is that confidence improved with repeat exposure to the same simulation among the residents that attended the simulation more than one time.
- We are aware that an increase in confidence is not equal to an increase in performance. The authors would argue that an increase in confidence allows the resident to be more ready when procedure and clinical opportunities arise. But it is imperative to know one's limits so that one does not develop false confidence, which could lead to medical error and/or patient harm.
- There were several hurdles and limitations that were encountered through the course of this research project. The overarching hurdle was the SARS-CoV-2 pandemic, which limited access to in-person training as well as the number of available residents in one room when presenting the simulation. Another potential hurdle was that sessions were voluntary, which likely decreased participation.
- Areas for improvement include assessment for correlation between amount of procedures done in clinic with simulation attendance & post-simulation confidence rating. Another area for improvement would be to diligently collect both pre & post knowledge assessments for each simulation. With this data we would be able to assess resident performance, which then could be standardized into a grading system.
- As for biases, we realize the list of simulations could not be all-inclusive for either residency. We are hopeful that as simulation training becomes more accessible and standardized, a common set of simulations may be proposed as a core competency for graduation requirement.

CONCLUSION

In conclusion, we showed that installing a simulation curriculum can improve resident confidence in handling core clinical scenarios and procedures within Family Medicine. We then demonstrated that simulation curriculums are translatable across core specialties by installing a similar curriculum at an IM residency with reproducible results. By adopting simulation curricula across the country to all FM and IM residencies we believe that it can help standardize resident education between programs regardless of residency location, patient population, and clinical volumes. This theoretically would ensure that each resident has the same minimum exposure to core clinical scenarios and procedures as well as potentially improve patient safety and care.

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