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Integrating Emergency Care with Population Health

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COUNCIL OF RESIDENCY DIRECTORS IN EMERGENCY MEDICINE

Special Issue on Educational Research and Practice

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AMERICAN COLLEGE OF EMERGENCY PHYSICIANS

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Western Journal of *Emergency Medicine*:
CDEM/CORD 2024 Special Education Issue

A Note from the Editors:

We are excited to publish the 9th issue of the Western Journal of Emergency Medicine (WestJEM) Education Issue and first year of a rolling decision process. Over 10 years ago a unique relationship was formed between WestJEM, the Council of Residency Director for Emergency Medicine and the Clerkship Directors of Emergency Medicine. The idea was to promote and disseminate educational scholarship which has been accomplished over the past decade. Senior and junior researchers have an opportunity to publish in the education issue because of the diverse nature of our submission categories, ranging from original research to brief educational advances. A successful issue requires the courage of the authors to submit their work for peer review and we do our best to provide detailed feedback regardless of the final decision. Publication of the issue requires the commitment and hard work of the publication staff, leadership of the organizations, editors, and peer reviewers. We want to thank them all for their efforts and professionalism. The topics of this year's education issue likely reflect the focus of educators as we entered a post-covid reality. Many of the topics were related to innovative curriculums and focused on the benefits derived. There were also several articles that were dedicated to the administrative aspects of residency and fellowships and how that has changed after COVID. We have already started to receive and review submissions for next year's education issue. The editorial staff review every submission on a rolling basis and, once accepted, the articles are available on PubMed. There are also no processing fees when accepted to the Education Issue. This is a great opportunity to submit your educational scholarship, thereby enhancing your professional development and disseminating your work to others. We are excited that this experiment has flourished, and we look forward to seeing your work in our 10th anniversary issue.

Jeffrey Love, MD
Georgetown University School of Medicine
Co-Editor of Annual Special Issue on Education Research and Practice

Douglas Ander, MD
Emory University
Co-Editor of Annual Special Issue on Education Research and Practice

The *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health* would like to thank The Clerkship Directors in Emergency Medicine (CDEM) and the Council of Residency Directors in Emergency Medicine (CORD) for helping to make this collaborative special issue possible.

Western Journal of *Emergency Medicine*:

Integrating Emergency Care with Population Health

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JOURNAL FOCUS

Emergency medicine is a specialty which closely reflects societal challenges and consequences of public policy decisions. The emergency department specifically deals with social injustice, health and economic disparities, violence, substance abuse, and disaster preparedness and response. This journal focuses on how emergency care affects the health of the community and population, and conversely, how these societal challenges affect the composition of the patient population who seek care in the emergency department. The development of better systems to provide emergency care, including technology solutions, is critical to enhancing population health.

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Policies for peer review, author instructions, conflicts of interest and human and animal subjects protections can be found online at www.westjem.com.

2023 Gold Standard Reviewers

The *West*JEM Special Issue in Educational Research & Practice couldn't exist without our many reviewers. To all, we wish to express our sincerest appreciation for their contributions to this year's success. Each year a number of reviewers stand out for their (1) detailed reviews, (2) grasp of the tenets of education scholarship and (3) efforts to provide feedback that mentors authors on how to improve. This year's "Gold Standard" includes:

- Ignacio Calles/Jeffrey Riddel*
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*Mentored Peer Reviews from Emergency Medicine Education Fellowship Programs

CDEM/CORD Guest Consulting Editors

We would also like to recognize our guest consulting editors who assisted with pre-screening submissions during our initial peer-review stages. Thank you for all of your efforts and contributions.

CDEM

- Christine Stehman
- Andrew Ketterer
- Eric Shappell
- Sharon Bord

Consulting Statistician/ Psychometrician

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Clerkship Directors in Emergency Medicine

COUNCIL OF RESIDENCY DIRECTORS IN EMERGENCY MEDICINE

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Virtual Interviews and the Pediatric Emergency Medicine Match Geography: A National Survey

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Introduction: Virtual interviews (VI) are now a permanent part of pediatric emergency medicine (PEM) recruitment, especially given the cost and equity advantages. Yet inability to visit programs in person can impact decision-making, leading applicants to apply to more programs. Moreover, the cost advantages of VI may encourage applicants to apply to programs farther away than they might otherwise have been willing or able to travel. This could create unnecessary strain on programs. We conducted this study to determine whether PEM fellowship applicants would apply to a larger number of programs and in different geographic patterns with VI (2020 and 2021) as compared to in-person interviews (2018 and 2019).

Methods: We conducted an anonymous national survey of all PEM fellows comparing two cohorts: current fellows who interviewed inperson (applied in 2018/2019) and fellows who underwent VIs in 2020/2021 (current fellows and those recently matched in 2021). The study took place in March–April 2022. Questions focused on geographic considerations during interviews and the match. We used descriptive statistics, chi-square and *t*-tests for analysis.

Results: Overall response rate was 42% (231/550); 32% (n = 74) interviewed in person and 68% (n = 157) virtually. Fellows applied to a median of 4/6 geographic regions (interquartile range 2, 5). Most applied for fellowship both in the same region as residency (216, 93%) and outside (192, 83%). Only the Pacific region saw a statistically significant increase in applicants during VI (59.9% vs 43.2%, $P = 0.02$). There was no statistical difference in the number of programs applied to during in-person vs VI (mean difference (95% confidence interval 0.72, –2.8 – 4.2). A majority matched in their preferred state both during VI (60.4%) and in-person interviews (65.7%). The difference was not statistically significant ($P = 0.45$).

Conclusion: While more PEM fellowship applicants applied outside the geographic area where their residency was and to the Pacific region, there was no overall increase in the number of programs or geographic areas PEM applicants applied to during VI as compared to in-person interview seasons. As this was the first two years of VI, ongoing data collection will further identify trends and the impactof VI. [West J Emerg Med. 2024;25(4.1)1–5.]

INTRODUCTION

Since 2020, virtual interviews (VI) have been preferred for trainee recruitment.[1] With the benefits of lower cost and greater equity, it is likely to remain a permanent part of recruitment, despite a general preference for face-to-face interviews.[2–5] The VI process and associated perceptions have been described in the literature.[2,3,6–9] The inability to visit a program in person can impact decision-making during ranking,[4,10–14] and an increased number of applications could create undue strain on programs.[15–17]

Geographic location, sense of "fit," and program leadership were described as major contributors to applicants' rank preference.[18] A national cohort of pediatric emergency medicine program directors (PEM PD), in a joint statement, raised concern that VI could lead applicants to apply to more programs and to programs farther away than they may be willing or able to travel.[10] We conducted this study to determine whether PEM fellowship applicants would apply to a larger number of programs and in different geographic patterns with VI (2020 and 2021) as compared to in-person interviews (2018 and 2019).

What do we already know about this issue?
Virtual interviews are a permanent part of recruitment. They offer cost and equity advantages while posing challenges to both applicants and programs.

What was the research question?
Did PEM fellowship applicants apply to a larger number of programs and in different geographic patterns with VI as compared to in-person interviews?

What was the major finding of the study?
VI did not have a significant impact on the number of programs or geographic areas applicants applied to.

METHODS

Design and Participants

This was an anonymous, self-administered, cross-sectional, web-based survey of PEM fellows in the United States. Participation was voluntary, and no incentive was provided for completion. The study was exempted by the institutional review board at Yale University, with informed consent implied by completion of the survey by participants.

Survey Development

The survey questionnaire was developed through iterative feedback and a modified Delphi process to determine item importance. Thirteen PEM PDs with expertise in performance and evaluation participated in multiple rounds of revisions and editing. Pilot testing was conducted with two pediatric hospital medicine fellows who had applied to the match during VIs and two pediatric chief residents who were also interviewing for fellowships using VI, at the lead institution. Revisions were made based on pilot feedback (survey provided in Supplementary Appendix 1). The survey included multiple-choice questions about location of residency, states applied to and interviewed for fellowship, preferred location for fellowship, states visited in person for the purpose of the match, and state matched in. It also asked fellows to indicate states of residence of immediate family (parents, siblings, or partners) and about compelling reasons (other than family) that may have led fellows to favor a state or region (free text). Geographic regions were defined as Northeast, Southeast, Midwest, Southwest, Rocky Mountain, and Pacific regions.[19]

Survey Distribution

The survey was reviewed and approved by the American Academy of Pediatrics (AAP) Section on Emergency Medicine (SOEM) PD survey subcommittee prior to distribution on Qualtrics (Qualtrics, Provo, UT) to all PEM PDs, via the AAP SoEM PD Committee listserv. The PDs forwarded the survey link to their current and incoming fellows (those recently matched to start in July 2022). Each PD completed a separate questionnaire indicating the total number of current and recently matched fellows to whom they forwarded the survey.

Analysis

Participants were divided into two groups: VI (2020 or 2021) and in person (2018 or 2019). We performed descriptive statistics including frequencies, percentages, means with standard deviations, and medians with interquartile range (IQR). Chi-square tests compared categorical variables and t-tests, continuous variables with 95% confidence intervals (CI). We considered a two-tailed alpha of <0.05 to be statistically significant. We conducted analyses in IBM SPSS Statistics version 28 (IBM Corporation, Armonk, NY).

RESULTS

The PDs reported that they forwarded the survey to 406 current fellows and 144 incoming fellows. The response rate for current fellows was 35% (143/406) and for incoming fellows, 61% (88/144). Overall, the response rate was 42% (231/550). Of the total respondents, 62% (143/231) were current fellows and 38% (88/231) incoming. Two fellows (1%) did not complete residency in the US, and 12 (5%) applied to PEM fellowship more than once.

All incoming fellows had undergone VI, whereas 48% of the current fellows had undergone VI (69/143). Overall, 32% of respondents (74/231) interviewed in person and 68% (157/213) virtually. There was no statistical difference in the number of programs applied to during in-person vs VI (mean difference (95% CI): .72 [−2.8, 4.2]) (Appendix 2 Table).

Data describing the geographic training and location preference of participants are presented in the table in appendix 2. Fellows applied to a median of four of the six geographic regions (IQR 2, 5). Most participants applied for fellowship in the same geographic region as their residency (216, 93%) and outside their residency region as well (192, 83%). Only the Pacific region saw a statistically significant increase in applicants during VI (59.9% vs 43.2%, $P = 0.02$) (Table 1).

Less than half of respondents had immediate family members living in the same state as residency (N = 111, 48%), fellowship (N = 90, 39%), or their preferred match state (N = 95, 41%). Compelling reasons to apply to an area included familiarity with location (N = 128, 55%); similar location to residency (N = 65, 28%); and a desire to train in a new area (N = 53, 23%). Partner's employment was an important factor for 89 (38%), salary and cost of living for 76 (33%), and school for children for 20 (9%).

DISCUSSION

Our results show that VI may allow some candidates to explore and consider regions they may not have otherwise due to logistical or financial constraints, without increasing the number of programs, regions or states they apply to. These results are consistent with the 2021 NRMP survey where 52% reported no impact of the VI on the number of programs applied to.[5] Residency programs have reported an increase in matched internal candidates during VI.[11,12,20,21] In PEM, a pre-pandemic study of PDs showed that 29% of fellows completed residency at the same institution.[22] While we did not have data at the institutional level, there was no significant increase in fellows matching within the state of their residency program with VI. This suggests that VI were not a significant detriment to applicants ranking programs and geographic areas, despite the absence of opportunities to meet in person and visit programs. This also allows programs to have access to a larger and potentially more diverse pool of candidates.[9]

Proximity to family was not a significant consideration for most applicants and was not impacted by VI. Residency

Table 1. Influence of virtual interviews on applicant behavior and outcomes.

	In-person interviews (N = 74)	Virtual interviews (N = 157)	Statistical significance (*P* value or 95% CI)
Applied to region for fellowship, N (%)			
Northeast	59 (79.7)	123 (78.3)	0.81
Southeast	41 (55.4)	102 (65)	0.16
Midwest	50 (67.6)	111 (70.7)	0.63
Southwest	38 (51.4)	86 (54.8)	0.63
Rocky Mountains	31 (41.9)	73 (46.5)	0.51
Pacific	32 (43.2)	94 (59.9)	0.02
Applied to same geographic region as residency, N (%)	71 (98.6)	145 (94.8)	.278
Applied outside geographic region as residency, N (%)	56 (77.8)	136 (88.9)	0.03
Number of regions applied to, mean (SD)	3.4 (1.8)	3.8 (1.8)	Mean difference (95% CI): .36 (−.15, .89)
Number of states applied to, mean (SD)	9 (7.3)	9.7 (6.8)	Mean difference (95% CI): .73 (−1.2, 2.7)
Number of programs applied to, mean (SD)	13.3 (12.8)	14 (12.5)	Mean difference (95% CI): .72 (−2.8, 4.2)
Number of programs interviewed at, mean (SD)	7.2 (4.7)	6.9 (5.2)	Mean difference (95% CI): −3.1 (−1.7, 1.1)
Matched in preferred state, N (%)	46 (65.7)	84 (60.4)	0.46
Matched in same state as residency, N (%)	31 (42%)	59 (38%)	0.58
Preferred to match in state with immediate family present, N (%)	36 (52.9)	59 (46.8)	0.42
Went to visit state/program, N(%)	9 (14)	23 (17)	0.61

CI, confidence interval.

applicants reported geography, quality of life, case variety, curriculum, institutional reputation, expertise in areas of interest, and program size as key factors.[23] Applicants to PEM highlighted familiarity with the region or wanting to explore a new area as factors for exploring programs in different regions.

LIMITATIONS

Limitations of this study include the smaller response rate of the current fellows as compared to the incoming fellows. This low response rate limited the sample size of the in-person cohort, impacting the statistical significance of our results. This differential response from the incoming fellows may have been due to desirability bias where this cohort of applicants may have tended to state that they matched in their preferred state. To minimize this, we designed our study to be fully anonymous and self-administered, and the questions were worded to retain objectivity of the answers. Respondents may also have experienced recall bias regarding the states and programs to which they applied. This bias could potentially have contributed to the lower response rate among the current fellows who had interviewed in 2018/2019, 3–4 years prior to the survey date, compared to the more recent applicants who had a more recent recollection of the questions asked in the survey.

Another limitation is that we didn't explicitly ask the total number of fellows in each class cohort; however, since the PEM fellowship class size in the US doesn't vary significantly from year to year (by virtue of the approved fellowship positions available), the denominator is expected to be relatively constant.

This study was not designed to look at the rates of applications to individual programs nor assess the post-match opinions of programs and fellows regarding the results of the match. This information would provide a deeper insight into the impact of the recruitment process; however, it is also prone to bias as fellows only experience training at a single institution. We also did not take into consideration the concentration of PEM programs by region or the available fellowship slots per program or region. However, the objective of this study was to look at the differences before and during VIs, and there was not a significant change in available fellowship slots or programs during these years. As the number of pediatric fellowship applicants rises, further investigation into the impact of VIs is necessary to gain a deeper understanding of its implications and to optimize this process both for applicants and programs.[24]

CONCLUSION

While more PEM fellowship applicants applied outside the geographic area where their residency was and to the Pacific region, there was no overall increase in the number of programs or geographic areas that PEM applicants applied to during VI during the first two years of its institution, as compared to in-person interview seasons. Ongoing monitoring of the interview and match seasons will help identify future trends and impact of VIs.

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Conflicts of Interest: By the *West*JEM article submission agreement, all authors are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. No author has professional or financial relationships with any companies that are relevant to this study. There are no conflicts of interest or sources of funding to declare.

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Perception of Quiet Students in Emergency Medicine: An Exploration of Narratives in the Standardized Letter of Evaluation

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Introduction: The Standardized Letter of Evaluation (SLOE) is designed to assist emergency medicine (EM) residency programs in differentiating applicants and in selecting those to interview. The SLOE narrative component summarizes the student's clinical skills as well as their non-cognitive attributes. The purpose of this qualitative investigation was to explore how students described in the SLOE as quiet are perceived by faculty and to better understand how this may impact their residency candidacy.

Methods: This retrospective cohort study included all SLOEs submitted to one EM residency program during one application cycle. We analyzed sentences in the SLOE narrative describing students as "quiet," "shy," and/or "reserved." Using grounded theory, thematic content analysis with a constructivist approach, we identified five mutually exclusive themes that best characterized the usage of these target words.

Results: We identified five themes: 1) quiet traits portrayed as implied-negative attributes (62.4%); 2) quiet students portrayed as overshadowed by more extraverted peers (10.3%); 3) quiet students portrayed as unfit for fast-paced clinical settings (3.4%); 4) "quiet" portrayed as a positive attribute (10.3%); and 5) "quiet" comments deemed difficult to assess due to lack of context (15.6%).

Conclusion: We found that quiet personality traits were often portrayed as negative attributes. Further, comments often lacked clinical context, leaving them vulnerable to misunderstanding or bias. More research is needed to determine how quiet students perform compared to their non-quiet peers and to determine what changes to instructional practices may support the quiet student and help create a more inclusive learning environment. [West J Emerg Med. 2024;25(4.1)6–9.]

INTRODUCTION

The emergency medicine (EM) Standardized Letter of Evaluation (SLOE) is a high-stakes assessment designed to assist residency programs in differentiating applicants and is considered important in the decision to interview.[1,2] The narrative component summarizes the student's knowledge, clinical skills, and non-cognitive attributes shown to be predictors of performance.[3–5] However, the narrative may be difficult to interpret due to the use of overly general language and hidden code, both common in written assessment.[6–9] Further, comments about personality often lack clinical context, which reduces their usefulness and makes them vulnerable to misinterpretation or bias.[6–8]

We became interested in SLOE narratives referencing quiet students during applicant review when we observed less enthusiasm for students described as quiet, even for those with strong objective application data. While non-cognitive attributes are important components of holistic assessment, personality traits should not necessarily hinder a strong application.[3–5] No studies show that quiet individuals are

unsuited for EM or are less successful in EM careers. However, in an internal medicine setting, "quiet" was interpreted by attendings as a "red flag" in clerkship written evaluations, [9,10] and students described as quiet in their SLOE scored lower on both global assessment and anticipated rank list.[11] We found no other research examining how quiet individuals perform or how they were perceived in EM. The purpose of this qualitative investigation was to explore how quiet students are described in the SLOE narrative and how this language may impact candidacy.

METHODS

Study Design and Population

We conducted a subgroup analysis of a retrospective cohort study of all core EM rotation SLOEs submitted through the Electronic Residency Application Service (ERAS) to one EM residency program during the 2016–2017 application cycle. We excluded SLOEs from non-Liaison Committee on Medical Education accredited schools and applicants who graduated from medical school before or during the application cycle. The study was approved by the institutional review board and the Association of American Medical Colleges.

Study Protocol and Data Analysis

Author JM downloaded SLOEs from ERAS into REDCap (Research Electronic Data Capture tools hosted at UC San Francisco). and de-identified them prior to analysis. Analysis was performed by JKQ, EHC, and JM, all with training in medical education research methodology and education leadership experience (chief resident, associate residency director, and assistant residency director). JKQ and EHC brainstormed words typically used to describe quiet individuals and chose the target-descriptors quiet, shy, and reserved (collectively termed "quiet") because passive, introverted, and timid were uncommon (3, 2, and 1, respectively) and always co-occurred with target-descriptors. We analyzed only the sentence containing the target-descriptors without exploring the entire narrative. We analyzed data using grounded theory thematic content analysis with a constructivist approach.[12] There was no pre-existing theory about the data that we aimed to prove or disprove; instead, the goal was to explore SLOE narrative-comments and construct meaning from them to provide perspective on how quiet students are perceived.

Without a preset idea of how data would be sorted, JKQ and EHC independently began the initial coding by reading each comment and considering how it was used to describe the student. As usage patterns emerged they were coded as like-comments. JM read a subset of the data. To establish that the dataset was sufficient for the purpose of the investigation, we coded the first half of the dataset and then determined that no new patterns emerged in the second half. We progressed to explaining our coding schemes, comparing them, and looking for similarities and differences. Through an iterative process of constant comparison we combined, deleted, and refined codes, merging them into overarching themes. We used a spreadsheet to visually organize codes and final themes.

RESULTS

We reviewed 1,582 SLOEs from 696 applicants. Of these, 117 SLOEs referenced quiet applicants and were analyzed. The adjective "quiet" occurred in 102 SLOEs. "Reserved" occurred in 28 SLOEs and co-occurred 14 times with "quiet." "Shy" occurred in 11 SLOEs and co-occurred five times with "quiet."

Initial coding revealed usage related to interpersonal skills, initiative, disposition, patient interactions, leadership, medical knowledge, response to feedback, work habits, and fitness for EM. Further analysis revealed that many target sentences did not fit into these categories, lacked clinical context, and were difficult to interpret. We eventually reached a consensus on a framework of five mutually exclusive overarching themes that included all comments, best represented the scope of usage patterns, and would be most meaningful in addressing our study purpose (Table 1).

Theme 1 comments, 62.4% describe quiet traits as implied-negative attributes. Comments are labeled "implied" because quiet is not explicitly called negative but is typically coupled with a contrasting positive trait that appears to be an effort to mitigate the negativity of the quiet comment (eg, "Quiet but hardworking"). The structure of the sentence makes it clear that quiet is negative, but it is not evident in what way or to what degree it is negative. A smaller number of comments linked the quiet trait with another seemingly negative attribute (eg, "Quiet and timid at times"). The implied negativity of these comments coupled with the lack of context may adversely affect the applicant's candidacy.

Theme 2 comments (10.3%) describe quiet students as being overshadowed by more extraverted peers and thus more difficult to assess. These comments also did not explain how performance was impacted by the quiet trait, only that the student was not able to demonstrate value as a candidate or perform at the level of their peers, which presumably hinders applicant candidacy.

Theme 3 comments 3.4%) question the fitness of quiet students for fast-paced clinical settings. However, these comments did not detail how, or to what degree, the student's quietness specifically affected performance, making them vulnerable to misinterpretation. These comments would likely also hinder candidacy, as the ability to perform well in all clinical settings is presumably seen as necessary in a successful EM resident.

Theme 4 comments (10.3%) "quiet" is portrayed as a positive attribute and tends to describe leadership style,

Table 1. Thematic analysis of 117 sentences containing the words "quiet", "shy" or "reserved".

Theme	Subthemes	Examples
Theme 1) Implied negative (n = 73)	1A) Quiet nature is mitigated by associating with a positive interpersonal skill.	"Quiet but was always able to communicate effectively." "Somewhat reserved but can be assertive when necessary."
	1B) Quiet nature is mitigated by associating with a positive attribute unrelated to quiet personality.	"Quiet but hardworking." "Can be reserved at times but is incredibly intelligent."
Theme 2) Quiet students may be overshadowed by others (n = 12)	2A) Quiet students overshadowed by more extraverted students.	"Quiet demeanor and presence of flashier students prevented a higher ranking." "Overshadowed, quieter than peers, disappeared into background most of the month."
	2B) Quiet students' clinical skills difficult to assess due to their quiet personality.	"Truncated presentations and quiet demeanor make it difficult to evaluate true potential." "So quiet I could not judge level of engagement."
Theme 3) Quiet students may be less suited for certain clinical settings (n = 4)	3A) Quiet students perceived as too passive, slow, or unassertive for a busy clinical setting.	"Quiet, passive nature may not be suited for high paced inner-city ED." "Quiet and unassuming personality, some noted this to be a concern, particularly in a busy county ED, others didn't."
	3B) Quiet students perceived as less adaptable to the demands of a busy clinical setting.	"Calm, quiet, reserved demeanor- some staff question adaptability to chaotic ED."
Theme 4) Positive trait (n = 12)		"Soothing demeanor and quiet confidence will suit quite well throughout their career." "Quiet demeanor, kind bedside manner which is an asset with patients."
Theme 5) Equivocal (n = 16)		"A little quiet, we do not think this will hinder ability to be a very capable EM resident." "Quiet"

ED, emergency department; *EM*, emergency medicine.

patient interactions, or ability to perform under pressure, rather than describing student personality. This additional context may have contributed to the overall perception of "quiet" as a positive attribute. Theme 5 comments (15.6%) were considered equivocal in that the investigators either did not agree on the positivity or negativity of their interpretation, or the comments lacked sufficient context to interpret the intended meaning (eg, "Student was initially quiet").

DISCUSSION

We found that quiet traits were usually portrayed as negative attributes and, therefore, had the potential to adversely affect the candidacy of a considerable number of applicants. The analysis also revealed that across themes the quiet trait was rarely described in terms of clinical competency. This is concerning because a negative comment that lacks context requires the reader to rely on inferences or assumptions that may result in unfairly judging the applicant. Providing examples that describe observed behavior and clinical skill, rather than referencing personality, will improve the quality and fairness of the assessment.[6,7]

Our findings that quiet students are described as being overshadowed by more extraverted peers, more difficult to assess, and less fit for fast-paced clinical settings suggest the possibility that current instructional practices favor more outgoing students. In a clinical setting where being assertive is viewed favorably, quiet students may be judged unfairly as being less knowledgeable or prepared.[3,13] Changes to instructional practices that may better serve quiet students include the following: providing additional student observations[6]; using standardized assessment-tools[14,15]; expanding assessment criteria to include strengths of the introvert[13]; providing faculty development to improve quality of written assessment[7]; using group-written SLOEs that may reduce bias[1,2]; and providing student mentorship.[3]

LIMITATIONS

This study was limited to SLOEs from applicants to a single institution during one application cycle. We analyzed only the sentence containing the target-descriptors; reading the entire narrative may have provided additional context. Target-descriptors may be defined differently by different evaluators and readers and may or may not be used interchangeably. Further, readers may interpret the

positivity or negativity of the usage differently than the investigators. The target-descriptors may not reflect student personality but rather how they were perceived by their evaluator in the clinical setting. Applicants did not receive a personality inventory nor did they self-report their personality type. We did not identify the gender of applicant or the SLOE writer, which prevented us from determining whether our findings were affected by gender. Nor did we identify the position or experience of the writer, or whether individual or group process was used. We did not attempt to associate quiet vs non-quiet status with an invitation to interview.

CONCLUSION

We found that quiet personality traits were often portrayed as negative attributes in the Standardized Letter of Evaluation. Additionally, clinical context was rarely provided, leaving comments open to variable interpretation and possible misunderstanding of student competency. These findings add to our understanding about quiet students in EM, but more research is needed to determine how quiet-labeled students perform compared to their non-quiet peers and to determine what changes to instructional practices may support the quiet student and help create a more inclusive learning environment where all students can thrive.

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Changes in Residency Applicant Cancellation Patterns with Virtual Interviews: A Single-site Analysis

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Background: Residency programs transitioned to primarily virtual interviews due to the COVID-19 pandemic. This shift raised questions regarding expectations and patterns of applicant cancellation timeliness. The purpose of this study was to examine changes in applicant cancellations after transitioning to virtual interviews.

Methods: This was a retrospective cohort study of interview data from a three-year emergency medicine residency at a tertiary-care academic medical center. Using archived data from Interview Broker, we examined scheduling patterns between one in-person (2019–2020) and two virtual interview cohorts (2020–2021 and 2021–2022). Our outcomes were the overall cancellation rates relative to interview slots as well as the proportion of cancellations that occurred within 7 or 14 days of the interview date.

Results: There were 453 interview slots and 568 applicants invited. Overall, applicants canceled 17.1% of scheduled interviews. Compared with in-person interviews, applicants canceled significantly fewer virtual interviews (in person: 40/128 (31.3%), virtual year 1: 22/178 (12.4%), virtual year 2: 15/143 (10.5%), $P = 0.001$). Conversely, applicants canceled significantly more virtual interviews within both the 14-day threshold (in person: 8/40 (20%), virtual year 1: 12/22 (55.5%), virtual year 2: 12/15 (80%), $P < 0.001$) and the 7-day threshold (in person: 0/40 (0%), virtual year 1: 3/22 (13.6%), virtual year 2: 4/15 (26.7%), $P = 0.004$).

Conclusion: While limited, at our site, changing to a virtual interview format correlated with fewer cancellations overall. The proportion of cancellations within 14 days was much higher during virtual interview seasons, with most cancellations occurring during that time frame. Additional studies are needed to determine the effects of cancellation patterns on emergency medicine recruitment. [West J Emerg Med. 2024;25(4.1)10–14.]

INTRODUCTION

Historically, residency applicants traveled to US programs for in-person interviews. In 2020, the COVID-19 pandemic led the Coalition for Physician Accountability (COPA) to recommend that residency programs conduct only virtual interviews.[1] Proponents of virtual interviews cited cost and safety as potential upsides, and applicants have reported overall satisfaction with virtual interviews and more advantages than barriers.[2–4] However, programs have expressed continued doubts about some aspects of virtual recruitment.[2]

Even before the pandemic, there were no established rules across specialties regarding an acceptable timeframe for interview cancellations. For emergency medicine, the Emergency Medicine Resident Association (EMRA) recommended at least two weeks' notice in their 2019 "EMRA and CORD Student Advising Guide."[5] In 2020, the first year of virtual interviews, email communication on the Council of Residency Directors in Emergency Medicine (CORD) listserv suggested that program directors' acceptable cancellation thresholds ranged from 48 hours to 10 days prior to the interview date.[6] Ultimately, CORD stated that seven days was recommended for applicants in a 2020 blog post about interviewing during the pandemic, while other publications still recommended two weeks.[7,8] Currently, the 2023 CORD Application Process Improvement Committee and the 2022–2023 National Resident Matching Program (NRMP) agreement have advised applicants to cancel no later than 1–2 weeks before their interview dates.[9,10]

Virtual interviews may be here to stay, as evidenced by recent COPA and Association of American Medical Colleges (AAMC) statements, as well as the 2023-24 CORD guidelines.[11–13] Understanding patterns of virtual interview cancellation behavior may help program directors, applicants, and their advisors prepare for a successful Match. To characterize the effects of virtual recruitment on interview cancellations, we compared in-person interview cancellation patterns to those of virtual recruitment cycles at our academic emergency medicine (EM) residency.

METHODS

This was a retrospective cohort study at a three-year EM residency sponsored by a tertiary-care, academic medical center in an urban setting in the south-central United States. This residency is an established program (founded in 1984) with a class size of 10 residents per year, which increased to 12 residents for the 2022 Match. The University of Arkansas for Medical Sciences Institutional Review Board (IRB) approved this study in exempt status.

Our program began using the online interview scheduling software Interview Broker (The Tenth Nerve, LLC, Lewes, DE; www.interviewbroker.com) in Fall 2019 to invite applicants to interview. In Fall 2020, interviews transitioned from in person to virtual and additional slots were added, with CORD continuing to recommend virtual interviews for EM residencies in subsequent cycles. Similar to in-person interviews, applicants for virtual interviews are invited in a 1:1 applicant to slot ratio and given 48 hours to respond before another applicant is invited.

Using archived data from Interview Broker, we examined scheduling patterns between the in-person interview cohort (2019–2020 season) and two virtual interview cohorts (Virtual Year 1: 2020–2021 and Virtual Year 2: 2021–2022). Unfortunately, cancellation data prior to the initiation of Interview Broker at our site was not available. A single investigator abstracted data from Interview Broker in aggregate form by academic year using overall counts of relevant variables, including number of interview slots, days, invitations, interviews scheduled/unscheduled (ie, no applicant response received)/declined, cancellations, and the timing of those cancellations relative to the interview date. We defined an interview cancellation as an interview that was scheduled, canceled, and never rescheduled; interviews that were rescheduled were considered completed. Demographic variables were not available as Interview Broker only records the student's name and AAMC ID; accessing additional information would have required querying the Electronic Residency Application Service, which was not covered in our exempt IRB agreement.

Our outcomes were the overall proportion of interview cancellations relative to interview slots, as well as the proportion of interview cancellations that occurred within 14 days of the interview date and within seven days of the interview date. Descriptive statistics were performed. We performed comparisons using chi-squared or the Fisher exact test as some observations were uncommon. All comparisons were two-sided with $\alpha = 0.05$. Analyses were performed using SPSS Statistics for Macintosh Version 28.0 (IBM Corporation, Armonk, NY).

RESULTS

Over three years, there were 453 interview slots and 568 applicants invited. Most of the interview slots were virtual (71.7%). Overall, the program sent out 1.25 interview applications per slot and applicants canceled 17.1% of scheduled interviews (Table 1). We found a significant decrease in the proportion of overall cancellations relative to filled interview slots, with 40/128 (31.3%), 22/178 (12.4%), and 15/143 (10.5%) cancellations for in-person, virtual year 1, and virtual year 2, respectively ($P < 0.001$). When analyzed further and adjusting for multiple comparisons, the decrease was significant when comparing in person vs. either virtual year, but not when comparing the two virtual years.

While fewer interviews were canceled, the proportion of virtual interview cancellations that occurred within 14 days of the interview date was significantly higher (in person: 8/40 (20%), virtual year 1: 12/22 (55.5%), virtual year 2: 12/15 (80%), $P < 0.001$). Similarly, more virtual interviews were canceled within seven days of the interview date (in person: 0/40 (0%), virtual year 1: 3/22 (13.6%), virtual year 2: 4/15 (26.7%), $P = 0.004$), although these numbers were low overall. In both the 14 and 7 day cancellation analyses, these data indicated a year-over-year increase, meaning in both 14 and 7 day comparisons we saw a significant increase in cancellations between in person and virtual year 1, and again saw a significant increase between virtual year 1 and virtual year 2. See Figures 1 and 2 for graphical breakdown of the

Table 1. Breakdown of in-person and virtual interview cohorts; total counts provided unless otherwise specified.

Interviews and Cancellations Interview group	In person	Virtual year 1	Virtual year 2
Number of interview days	15	16	16
Number of interview slots	128	180	145
Number of applicants invited	195	206	167
Number of invitations per interview slot	1.52	1.14	1.15
Total interview slots filled	128	178	143
Number of unscheduled invitations (ie, no applicant response received)	14	1	3
Number who declined without scheduling	13	5	6
Overall cancellations (% of scheduled)	40 (31.3%)	22 (12.4%)	15 (10.5%)
Number who canceled < 7 days (% of canceled)	0 (0%)	3 (13.6%)	4 (26.7%)
Number who canceled 7–14 days (% of canceled)	8 (20%)	9 (40.9%)	8 (53.3%)
Number who canceled >14 days (% of canceled)	32 (80%)	10 (45.5%)	3 (20.0%)
Overall declined, unscheduled, or canceled (% of total invited)	67 (34.4%)	28 (13.6%)	24 (14.3%)

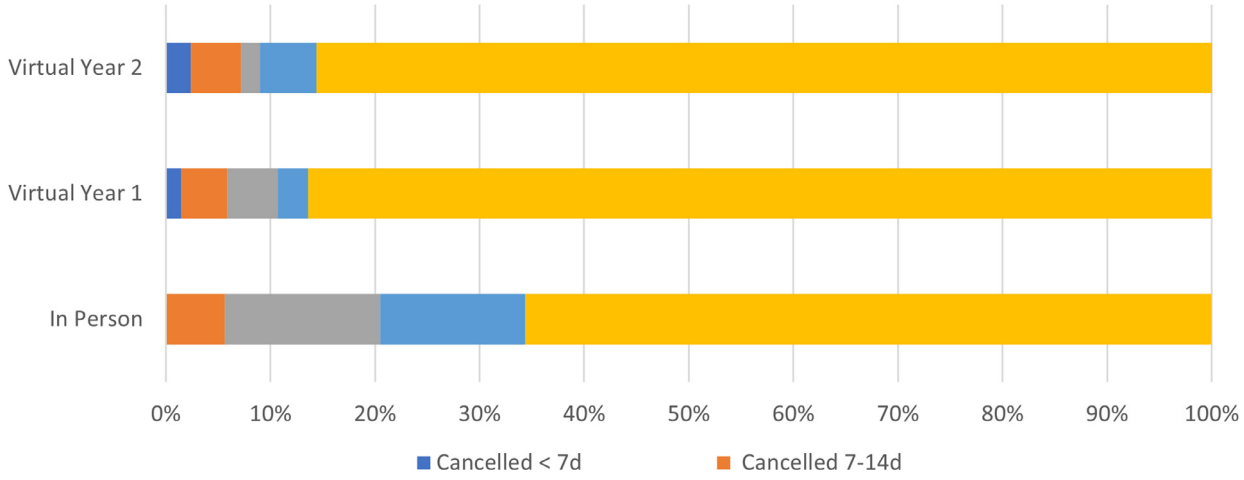

Figure 1. Overall distribution of invited applicants.

overall distribution of invited applicants and interview cancellation rates.

DISCUSSION

Compared with in-person interviews, applicants to our program were less likely to cancel their virtual interview. Of those who did cancel, several virtual applicants canceled within seven days, and most cancellations occurred within 14 days of the interview date. For in-person interviews, applicants were traditionally instructed to cancel as soon as possible and at least two weeks prior to the interview date.[5] As discussed previously, recommendations for EM virtual interview cancellations have ranged from 48 hours to two weeks, with the NRMP currently recommending at least 1–2 weeks in advance.[10] Our results suggest that short-notice cancellations (ie, less than two weeks) by students may be more common in the virtual era.

We are not aware of literature regarding the specific timing of virtual interview cancellations, but our finding of fewer overall cancellations is consistent with Lewkowitz et al's findings that maternal-fetal medicine fellowship virtual interviews had a lower rate of cancellations compared with in-person interviews (39.1% vs 72.3%).[14] This could stem from the reduced time and cost required to interview virtually.[15,16]

Unfortunately, fewer interview cancellations overall could contribute to interview hoarding and an inequitable distribution of interviews. The AAMC and some specialties have expressed concerns about higher quality applicants receiving invitations for and scheduling excessively high numbers of interviews and leaving lower tier students with

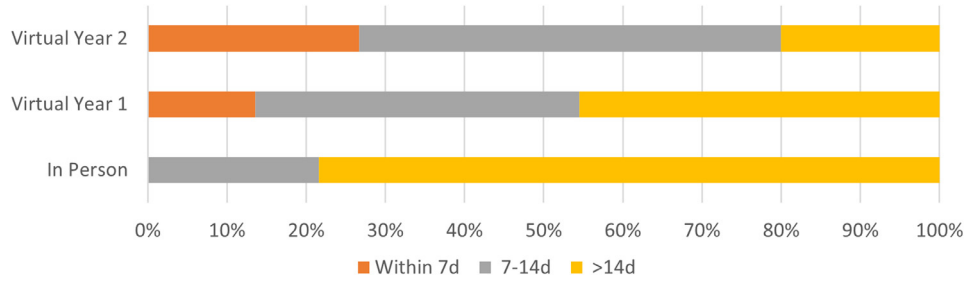

Figure 2. Interview cancellations by length of time from interview.
d, day.

fewer options.[15,17] While this has not been studied in EM specifically, the Emergency Medicine Consensus Statement on the 2020–2021 Residency Application process suggested an interview limit of 17 interviews and encouraged applicants not to interview at their less-preferred programs lower on their list to "make these slots available to other students," indicating a potential concern for the effects of hoarding such as "peers not matching and/or programs not filling."[18]

Short-notice interview cancellations pose a few other challenges for residency programs. Previously, filling an in-person interview slot required finding a replacement who could still arrange travel to the interview location, which is no longer relevant for virtual interviews. Nonetheless, the NRMP requires that programs provide no less than 48 hours for applicants to respond to interview invitations.[10] If applicants are canceling only a few days before an interview, filling the open spot may be a challenge since programs cannot invite more than one applicant at a time per spot. Short-notice cancellations can also be problematic as interviewers may have to review candidates' applications well in advance of the interview date. With short-notice cancellations, this could mean lost time for interviewers who had already reviewed those applications or inadequate time to review the replacements.

Conversely, program directors want to avoid interviewing applicants who are not interested in their program, and a cancellation—even on short notice— provides an opportunity to interview an applicant with greater interest in the program. In our case, we had only four open interview spots over the first two virtual years (two unfilled per year), indicating that we filled most canceled spots. Therefore, while no official opinion exists, program directors may not mind short-notice cancellation as long as the interview schedule is full. In fact, they may prefer for the applicant not to feel pressured to interview at a program in which they are uninterested only because they are concerned about canceling, with short notice being viewed as unprofessional. As virtual interviews appear to be here to stay, understanding cancellation patterns will be important for programs, especially in balancing the timing cancellations with new invitations so programs can ideally maintain a full interview schedule.

LIMITATIONS

This study was limited to one specialty at a single institution, therefore the generalizabilty of these findings to other institutions or specialties is unclear, especially given the small sample size and limited pre-post period. The changing landscape of EM residency recruitment may also affect the generalizability of these findings. Unfortunately, we had only one year of in-person interview data as we did not keep these records prior to the use of Interview Broker, which could have introduced bias. We also had an increase in resident complement during virtual year 2, which may have confounded the results. Unfortunately, we were unable to include demographic data, which might have helped to identify additional cancellation patterns. Lastly, examining trends in those who reschedule interviews was not performed in this study and may be of value in future investigations, as some downsides discussed with short-notice cancellations (eg, filling empty slots; having time to review applications) would still occur in applicants who are rescheduling with short notice.

CONCLUSION

Compared with in-person interview cycles, applicants to our residency program were significantly less likely to cancel virtual interviews. However, the majority of virtual cancellations that did occur were within 14 days of the interview date and nearly one-fifth occurred in under seven days. Additional studies, ideally multisite that include applicant demographic data, are needed to determine how cancellation patterns affect EM recruitment and match outcomes in the virtual era.

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Foundations of Emergency Medicine: Impact of a Standardized, Open-access, Core Content Curriculum on In-Training Exam Scores

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Introduction: Learners frequently benefit from modalities such as small-group, case-based teaching and interactive didactic experiences rather than passive learning methods. These contemporary techniques are features of Foundations of Emergency Medicine (FoEM) curricula, and particularly the Foundations I (F1) course, which targets first-year resident (PGY-1) learners. The American Board of Emergency Medicine administers the in-training exam (ITE) that provides an annual assessment of EM-specific medical knowledge. We sought to assess the effect of F1 implementation on ITE scores.

Methods: We retrospectively analyzed data from interns at four EM residency programs accredited by the Accreditation Council for Graduate Medical Education. We collected data in 2021. Participating sites were geographically diverse and included three- and four-year training formats. We collected data from interns two years before (control group) and two years after (intervention group) implementation of F1 at each site. Year of F1 implementation ranged from 2015–2018 at participating sites. We abstracted data using a standard form including program, ITE raw score, year of ITE administration, US Medical Licensing Exam Step 1 score, Step 2 Clinical Knowledge (CK) score, and gender. We performed univariable and multivariable linear regression to explore differences between intervention and control groups.

Results: We collected data for 180 PGY-1s. Step 1 and Step 2 CK scores were significant predictors of ITE in univariable analyses (both with $P < 0.001$). After accounting for Step 1 and Step 2 CK scores, we did not find F1 implementation to be a significant predictor of ITE score, $P = 0.83$.

Conclusion: Implementation of F1 curricula did not show significant changes in performance on the ITE after controlling for important variables. [West J Emerg Med. 2024;25(4.1)15–18.]

INTRODUCTION

Residency programs provide education and training to develop competent physicians. Board certification in emergency medicine (EM) requires completion of an Accreditation Council for Graduate Medical Education (ACGME)-accredited training program and a passing score on the Qualifying Examination (QE) and Oral Certification Examination (OCE) administered by the American Board of

Emergency Medicine (ABEM).[1,2] The ABEM In-training Examination (ITE) is an important tool used by training programs to assess medical knowledge and prepare residents for the QE.[1,3] The ITE is designed to reflect the content of the Model of Clinical Practice of Emergency Medicine (EM Model) and has predictive value in estimating the likelihood of individual residents passing the QE.[3] Prior literature suggests that clinical exposure alone leaves significant gaps in fundamental knowledge defined by the EM Model.[4] Residency didactic curricula provide an opportunity to supplement core knowledge; however, the best methods for providing instruction outside of the clinical setting and preparing trainees for successful performance on the ITE are unknown.

Foundations of Emergency Medicine (FoEM) is a national, free, open-access, online EM curriculum that has been widely adopted in the United States.[5,6] FoEM became available in 2015; registration for use of FoEM courses for the 2022–2023 academic year included 237 registered educational programs, serving 6,326 resident physicians.[5,6] FoEM offers standardized, level-specific, core content for EM residents using learner-centric educational strategies that have been shown to benefit learning such as small-group discussion, peer learning, and individualized guidance.[5–11] Foundations I (F1) is a flipped classroom, case-based course targeting postgraduate year (PGY)-1 residents that includes a 30-unit, systems-based curriculum of fundamental content in the EM Model.[5,6,12] Prior literature demonstrates positive effects of the flipped classroom model on learning outcomes.[13–15] The F1 curriculum includes curated self-study resources called "Learning Pathways" for learners to review prior to didactic meetings, in which residents work through multiple F1 cases with a knowledgeable facilitator providing information in an oral-boards style format.[6] The F1 summarizes essential learning points and shares them with learners to fill knowledge gaps and allow for spaced repetition.[6] Although the F1 curriculum is not specifically designed for ITE review, third-party paired assessments for each unit have been available for use since 2017.[6]

Limited outcome data of FoEM F1 established quality and demonstrated high satisfaction among faculty leaders and resident learners.[5,6] However, there has not been an assessment of objective measures such as medical knowledge and ITE performance This information can provide a more comprehensive assessment of the value of implementing such a program. In this study, we sought to evaluate the effect of F1 course implementation on ITE performance in the PGY-1 year. We hypothesized that implementation of the structured F1 curriculum would lead to improved performance on the ITE.

METHODS

We performed a retrospective cohort study of ITE data collected from PGY-1 residents at four ACGME- accredited EM residency programs in the United States before and after implementation of the FoEM F1 curriculum. We selected participating sites that were geographically diverse and included 3- and 4-year training formats. We collected data in December 2021. All PGY-1 residents at participating sites during the study period were eligible to participate. We excluded PGY-1 residents who were missing data.

We determined that to detect a 5% difference in ITE score with 80% power and an alpha of 0.05, we would need to enroll 81 participants in each group (control and intervention) for a total of 162 participants. Our control group consisted of data from PGY-1 residents for the two years prior to implementation at each site. Our intervention group consisted of data from PGY-1 residents for the two years after implementation at each site. Year of F1 implementation ranged from 2015–2018 at participating sites. The lead author from each site abstracted data using a standard form that included program, ITE raw total score, year of ITE administration, United States Medical Licensing Examination (USMLE) Step 1 score, USMLE Step 2 Clinical Knowledge (CK) score, and resident gender. Prior to data abstraction, the author group read each item on the form aloud and trialed abstracting a small portion of representative data to ensure clarity of meaning and consistency in process.

We calculated descriptive statistics for demographic data and ITE performance. We performed regression analyses to explore differences between the intervention and control groups. We first performed univariable linear regression analyses for variables including implementation of F1, residency program, year of ITE administration, USMLE Step 1 score, USMLE Step 2 score, and resident gender with ITE raw score as our outcome of interest. We included variables with a P-value < 0.1 in the univariable regression in a multivariable linear regression with the same outcome variable.We considered variables with a P-value of < 0.05 in the multivariable model as statistically significant. We performed all analyses in SPSS v 27.0 (IBM Corporation, Armonk, NY).

This study was approved by the Institutional Review Board of the David Geffen School of Medicine at UCLA.

RESULTS

We abstracted data from a total of 224 interns. We excluded 44 interns who were missing data. We analyzed data from 180 interns (88 pre-implementation and 92 post-implementation) who had complete data. The demographics of participants with complete data are shown in Table 1. The mean ITE raw score for interns in the control group was 72.15 ± 6.72. The mean ITE score for interns in the intervention group was 72.74 ± 7.93. In the univariable regression analyses, only USMLE Step 1 and USMLE Step 2 CK scores yielded P-values of < 0.1 (Table 2). Because our hypothesis centered on the impact of implementation of the F1 curriculum on ITE scores, we forced this variable as the

Table 1. Demographic data of participating interns.

	Control group n (%) total n = 88	Intervention group n (%) total n = 92
Gender		
Male	32	31
Female	56	60
Non-binary	0	1
Mean USMLE Step 1 score (SD)	232 (14.26)	232 (15.59)
Mean USMLE Step 2 score (SD)	244 (17.02)	246 (14.54)

USMLE, United States Medical Licensing Examination.

Table 2. Results of univariable regression analysis of recorded variables.

Variable	*P*-value
Implementation of Foundations F1 curriculum	0.59
Residency program	0.22
Year of ITE administration	0.14
USMLE Step 1 score	<0.001
USMLE Step 2 CK score	<0.001
Resident gender	0.24

USMLE, United States Medical Licensing Examination; *ITE*, in-training exam; *CK*, clinical knowledge.

last variable after block entry of variables of USMLE Step 1 score and USMLE Step 2 CK score in the multivariable regression analysis, despite it having a *P*-value of 0.59 in the univariable analysis. After controlling for Step 1 score and Step 2 CK score, F1 implementation was not a significant predictor of ITE score, R square change = 0, $P = 0.83$. The data satisfied all assumptions.

DISCUSSION

Our study demonstrates that both Step 1 and Step 2 CK were significant predictors of ITE score. This is consistent with prior literature in multiple specialties demonstrating associations between USMLE scores and ITE performance.[16–19] We found that our intervention group had a slightly higher raw ITE scores however, after controlling for USMLE scores, this increase was not statistically significant, despite being adequately powered. This was somewhat surprising given that F1 provides a consistent structure and comprehensive coverage of content in the EM model and also incorporates teaching methods that have been shown to enhance learning.[2,6–11] However, our results align with previous studies, which have demonstrated that changes in curriculum were not associated with significant differences in ITE performance.[20,21] Specifically, converting an hour of synchronous didactic conference to asynchronous learning, and converting conference lectures to small group, "flipped-classroom" style learning have previously been found to have no significant effect on ITE scores.[20,21]

It is important to note that the objective of F1 is to improve EM core knowledge and application in the clinical environment and is not specifically targeted towards ITE test preparation or performance. Additionally, performance on the ITE may not comprehensively represent learner knowledge of EM. This may be one reason that we did not find significant changes in ITE performance. Additionally, variable implementation and usage of F1 at differing programs could influence potential gains. Although the FoEM courses are standardized, participating programs must address their own unique needs and barriers; this may result in variability in course implementation, including variable use of flipped-classroom style asynchronous resources and paired assessments. It is also important to note that the ITE is administered in February of each year; thus, participating PGY-1 residents in this study were only exposed to approximately seven months of the year-long F1 curriculum prior to the ITE.

It is possible that additional improvements may be seen with additional time spent in the curriculum. The nonsignificant improvement seen in this study may be augmented with implementation of Foundations II (F2), which is designed for PGY-2 residents, and Foundations III (F3), which is designed for PGY-3 and PGY-4 residents. These outcomes merit further investigation. While our study did not find a significant increase in ITE scores compared to standard curricula, it was not worse than standard practice and has additional benefits of a free, standardized, pre-packaged, high-quality, adaptable format with user acceptability.[6]

Overall, the results of this study provide important insights for both the numerous programs already using FoEM and those EM residencies considering incorporating it into their training programs.[6] In addition to prior feasibility and user acceptability data, this study provides an evaluation of objective outcomes, namely knowledge, the first level in Miller's pyramid of clinical competence.[6,22] There are still many unanswered questions. Further investigation into the effect of the F1 curriculum on ABEM QE and OCE performance should be pursued. Additionally, as FoEM is designed to support knowledge application in the clinical space, future work could evaluate the impact of FoEM on other domains of resident performance.

LIMITATIONS

This study has limitations. There may be confounders not accounted for in our analysis that could have influenced results. We did not collect data on specific ITE preparation curricula at participating sites, individual usage of external ITE preparation materials outside of training program curricula, time spent using F1 curriculum, use of paired

assessments, total number of F1 units completed by participating residents, or time spent studying for ITE in general. However, to the best of our knowledge, there were no other major changes to the site's didactic curriculum or methods of preparing trainees for the ITE during the study period. Although the F1 course includes standardized content, participating programs must address their own unique needs and variables that impact the consistency of course administration. There may be differences in the personnel who deliver the content, attendance requirements, etc, which are not accounted for in our study. The results seen in this study may not transfer to other sites where adherence to implementation guidelines is more or less consistent.

CONCLUSION

Our study suggests that the FoEM F1 curriculum is not associated with significant changes in performance on the ITE in EM training programs after controlling for important variables. These results may inform the use and implementation of FoEM courses in EM training programs.

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Integrating Hospice and Palliative Medicine Education Within the American Board of Emergency Medicine Model

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Background: Hospice and palliative medicine (HPM) is a board-certified subspecialty within emergency medicine (EM), but prior studies have shown that EM residents do not receive sufficient training in HPM. Experts in HPM-EM created a consensus list of competencies for HPM training in EM residency. We evaluated how the HPM competencies integrate within the American Board of Emergency Medicine Milestones, which include the Model of the Clinical Practice of Emergency Medicine (EM Model) and the knowledge, skills, and abilities (KSA) list.

Methods: Three emergency physicians independently mapped the HPM-EM competencies onto the 2019 EM Model items and the 2021 KSAs. Discrepancies were resolved by a fourth independent reviewer, and the final mapping was reviewed by all team members.

Results: The EM Model included 78% (18/23) of the HPM competencies as a direct match, and we identified recommended areas for incorporating the other five. The KSAs included 43% (10/23). Most HPM competencies included in the KSAs mapped onto at least one level B (minimal necessary for competency) KSA. Three HPM competencies were not clearly included in the EM Model or in the KSAs (treating end-of-life symptoms, caring for the imminently dying, and caring for patients under hospice care).

Conclusion: The majority of HPM-EM competencies are included in the current EM Model and KSAs and correspond to knowledge needed to be competent in EM. Programs relying on the EM Milestones to plan their curriculums may miss training in symptom management and care for patients at the end of life or who are on hospice. [West J Emerg Med. 2024;25(4.1)19–26.]

INTRODUCTION

A third of adults who die will receive emergency department care in the month prior to their death.[1] Emergency physicians need training to provide the high-quality, goal-concordant care that these patients deserve. Hospice and palliative medicine (HPM) is a subspecialty of emergency medicine (EM) that adds an additional focus on symptom management, goal-concordant care, and quality of life, especially for patients with chronic disease or life-threatening conditions, or who are at the end of life.[2] Prior research has shown that current EM residency training lacks instruction in HPM.[3–7] To address this, the American College of Emergency Physicians Palliative Medicine Section published a list of 23 critical developmental milestones in

HPM training for EM residents.[8] However, it is unclear how best to integrate these recommendations into an EM residency curriculum.

Many EM residency curriculums are based on the knowledge needed to pass the EM board certification exams. This knowledge is codified in the American Board of Emergency Medicine (ABEM) Model of the Clinical Practice of Emergency Medicine (EM Model) and a list of knowledge, skills, and abilities (KSA).[9,10] The EM model along with the KSAs are the foundational documents used to create the EM Milestones, a compendium ubiquitously employed in both EM training and assessment. Our goal in this study was to determine where the HPM competencies fit or could fit within the EM Model and KSAs. This mapping could help guide curriculum design or the incorporation of the HPM competencies into testing content.

METHODS

This study was not human subjects research and was deemed exempt from institutional review board review. We compared the 2019 EM Model and the 2021 KSAs to the HPM competencies. The HPM competencies were assigned numerals. The EM Model items were annotated by their number and category. The notations for the KSA categories and codes were used directly from the 2021 document. We divided the KSAs into overarching categories (eg, diagnosis, pharmacotherapy, reassessment) which we then further divided into sets of competencies within that category.[10] Each competency was given a hierarchy in training corresponding to an alphabetic level (with A the most advanced level of competency and E the least). Level A is reserved for advanced knowledge or skills. Level B is the minimal competency level, defined as the minimum skill level every EM resident should attain to graduate. Levels C, D, and E are skills in the development of reaching level B.

As this type of analysis has not been done before, we used a sequential approach with initial independent reviewers, a mediator step, and then final consensus group discussion. The consensus group results were then reviewed by two independent external experts. In the first phase of consensus mapping, two residents (EM postgraduate year (PGY)-2 and EM/internal medicine (PGY-4) and an EM attending independently mapped palliative care competencies using a Microsoft Excel spreadsheet (Microsoft Corporation, Armonk, NY). The three initial concept mappers had independent data sheets and were blinded to each other's determinations. A competency could map onto more than one area of the EM Model. First, keywords from each HPM competency were searched for in the EM Model. If no matches were found, the EM Model was reviewed line by line to determine whether there were conceptual matches. If there was no direct match, but the HPM competency could be incorporated under a topic, this was listed as a potential area for incorporation.

Any topic that did not have at least 2/3 agreement on the initial independent review was reviewed by a fourth emergency physician with expertise in EM resident education and EM Model development. She was blinded to the initial reviewer's names but did have their results. The full group met and reviewed all the mapping until consensus was reached. The consensus tables were then reviewed independently by two additional external HPM board-certified EM attendings involved in resident education at two different EM residency programs. The same process was used for mapping the KSAs.

RESULTS

Incorporation into the Emergency Medicine Model

Fifty-one of 963 EM Model items were tagged in the independent first round of mapping, with 98.7% consensus (951/963) between the initial three independent reviewers on whether an item was or was not tagged as a match. The final review by the independent HPM-boarded EM attendings did not result in adjustments to any of the existing mapping but did add to the potential areas of fit for the HPM competencies that did not directly match onto the EM Model. Table 1 lists the competencies included in the 2019 EM Model (18/23, 78%). Many competencies fit into *EM Model category 20: Other Core Competencies* section, which includes communication skills, transitions of care, cultural competency, and healthcare coordination. Discrepancy discussions centered around management vs diagnosis. The competency *HPM 2: Treating distressing symptoms (eg, nausea/vomiting, dyspnea)* was felt to fit by keyword match under EM Model category *1.0 Signs, Symptoms and Presentations*. However, that category does not mention treatment of symptoms directly. Similarly, *HPM 18: Complications of Cancer* could map to many items in the EM model, but again refers to palliative management of cancer complications rather than diagnosis.

Potential Areas of Fit in the Emergency Medicine Model

Five HPM competencies did not fit into the EM Model. The first two, *HPM 7: Treating common end-of-life symptoms* and *HPM 8: Care for the imminently dying (expecting death within hours to days or recently deceased patient and their family members)*, could be taught under EM Model item *20.4.4.2.2: Systems-based Practice: Withdrawal of support.* This EM Model item could be clarified to ensure that it includes symptom control and end-of-life care. The next, *HPM 11: Caring for patients under hospice care,* could be taught when teaching *20.4.4.2.3: Systems-based Practice: Hospice Referral.* However, the hospice-referral EM Model item better mapped onto *HPM 17*, which includes assessing for and initiating hospice referrals. The team felt that identifying and referring patients to hospice was a separate skillset than caring for patients on hospice. The last two HPM competencies without a clear

Table 1. The hospice and palliative emergency medicine residency education competencies mapped onto the American Board of Emergency Medicine EM Model.

Hospice and palliative competency	Description	EM model item
1	Pain control: a. chronic pain, b. malignant and non-malignant pain.	19.3.1 Anesthesia and acute pain management- regional anesthesia 19.3.2 Anesthesia and acute pain management- procedural sedation 19.3.3 Anesthesia and acute pain management- analgesia
2	Treating distressing symptoms (eg, nausea/vomiting, dyspnea)	1.3.32 Nausea/vomiting 1.3.42 Shortness of breath **unclear whether these EM model elements refer to treating these symptoms or developing a differential diagnosis for these symptoms, but both should be taught.*
3	Difficult communication: a. delivery of bad news (eg, prognosis and death telling) b. conflict resolution (eg, between family members	20.1.2.2 Interpersonal and communication skills- conflict management 20.1.2.4 Interpersonal and communication skills- delivering bad news/death notifications
4	Goals of care discussions: a. assisting families with decision making. b. assisting patients with decision making	20.4.4.1 Health care coordination- advance directives
5	Caregiver support	20.3.4.6 Well-being and resilience- care for the caregiver
6	Non-initiation or stopping of nonbeneficial interventions	19.2 Resuscitation- cardiopulmonary resuscitation 20.1.1.3 Interpersonal skills- patient and family experience of care 20.4.4.2.2 Healthcare coordination- withdrawal of support
9	Bereavement and grieving	14.2.4 Mood disorders and thought disorders- grief reaction
10	Family-witnessed resuscitation	19.2 Resuscitation- cardiopulmonary resuscitation
12	Coping and self-care	20.3.4.1 Well-being and resilience- fatigue and impairment 20.3.4.1.1 Well-being and resilience- sleep hygiene 20.3.4.3 Well-being and resilience- work/life balance
13	End-of-life management in the mass casualty incident/event	20.4.2.2.1 Patient triage and classification
16	Screening for palliative care needs: a. identifying patients who may benefit from HPM specialist referral, b. identifying the imminently dying patient (expected death within hours-days).	20.4.4.2.1 Health care coordination- patient identification for palliative care 20.4.4.2.3 Health care coordination- hospice referral
17	Rapid palliative care assessment: a. aligning diagnostics and therapeutics to patient goals, b. functional, psychosocial, and spiritual assessment, c. assessing for and initiating hospice referrals, d. toolkits to help identify patient needs for appropriate referrals/resources, e. caregiver burden.	20.3.4.6 Well-being and resilience- care for the caregiver 20.4.4.2.3 Healthcare coordination- hospice referral 20.4.4.3.1 Healthcare coordination- activities of daily living/functional assessment

(*Continued on next page*)

Table 1. Continued.

Hospice and palliative competency	Description	EM model item
18	Complications of cancer: a. disease complications (eg, spinal cord compression, hypercalcemia), b. treatment complications (eg, pancreatitis, tumor lysis, neutropenia, acute renal failure).	2.9.2.3 Large bowel- radiation colitis
		2.9.2.5 Large bowel- neutropenic enterocolitis/typhlitis
		3.6.1 Diseases of the pericardium- pericardial tamponade
		8.7 Oncologic emergencies
		8.7.1 Oncologic emergencies- febrile neutropenia
		8.7.2 Oncologic emergencies- hypercalcemia of malignancy
		8.7.3 Oncologic emergencies- hyperviscosity syndrome
		8.7.4 Oncologic emergencies- malignant pericardial effusion
		8.7.5 Oncologic emergencies- spinal cord compression
		8.7.6 Oncologic emergencies- superior vena cava syndrome
		8.7.7 Oncologic emergencies- tumor hemorrhage
		8.7.8 Oncologic emergencies- tumor lysis syndrome
		11.1.4.2 Bony abnormalities-tumor-related fractures
		16.2.3 Disorders of the pleura, mediastinum, and chest wall-pleural effusion
		16.6.2 Pulmonary embolism/infarct- venous thromboembolism
		16.6.2.1 Pulmonary embolism/infarct- massive and submassive embolism
19	Ethical, spiritual, and cultural issues around end-of-life and death	20.1.2.5 Interpersonal and communication skills- cultural competency
20	Advance directives: a. physician order for life-sustaining treatment (POLST), b. medical order for life-sustaining treatment (MOLST), c. five wishes.	20.4.4.1 Healthcare coordination- advance directives
21	ethical and legal issues: a. decision-making capacity, b. futility.	20.3.2.4 Professionalism- medical ethics
		20.4.5.4 Regulatory/legal- consent, capacity and refusal of care- consent, capacity and refusal of care
22	Multidisciplinary team and support systems. (understanding team roles and system resources): a. spiritual chair, b. social chair, c. hospice care eligibility, d. continuing care, e. importance of local and community support systems.	20.1.1.1 Interpersonal skills- inter-departmental and medical staff relations
		20.1.1.2 Interpersonal skills- intra-departmental relations, teamwork, and collaboration skills
		20.4.2.4.1 ED administration- allied health professionals
23	Transitions across care settings, eg, inpatient vs home hospice, palliative care unit	20.4.4.2.1 Healthcare coordination- patient identification for palliative care
		20.4.4.2.3 Healthcare coordination- hospice referral

association with the EM Model were *HPM 14: Trajectories of dying: a. Terminal illness, b. Organ Failure, c. Frailty, d. Sudden Death,* and *HPM 15: Prognostication.* While these competencies necessitate having sound understanding of the natural history of disease as well as physical examination and clinical workup components informing prognosis, these are also skills for explaining the likelihood of death and communicating with patients and families. The team consensus was that these could be taught within the EM Model items *20.1.2.4 Interpersonal and Communication*

Table 2. The palliative emergency medicine competencies incorporate with the 2021 American Board of Emergency Medicine knowledge, skills, and abilities.

	Hospice and palliative medicine competency	KSA code	Description	Level
3	Difficult communication a. delivery of bad news (eg, prognosis and death telling) b. conflict resolution (eg, between family members)	CS17	Use flexible communication strategies to negotiate effectively with staff, consultants, patients, families, and others to provide optimal patient care, recognizing and resolving interpersonal conflicts	B
4	Goals of care discussions: a. assisting families with decision making. b. assisting patients with decision making.	CS3	Elicit patients' reasons for seeking healthcare and their expectations from the ED visit	D
		CS7	Consider the expectations of those who provide or receive care in the ED and use communication methods that minimize the potential for stress, conflict, and miscommunication	B
		CS15	Solicit patient participation in medical decision-making by discussing, risks, benefits, and alternatives to care provided	C
		ES15	Elicit the patient's goals of care prior to initiating emergency stabilization, including evaluating the validity of advanced directives	B
13	End-of-life management in the mass casualty incident/event	DM11	Participate in a mass casualty drill or event in an ED involving multiple patients, prioritizing care, containing potential exposures, and appropriately assigning resources	C
14	Trajectories of dying: a. terminal illness, b. organ failure, c. frailty, d. sudden death.	ES6	Recognize in a timely fashion when further clinical intervention is futile	B
		PE6	Educate patients on the natural course of their disease and impact of possible treatment in relation to prognosis	B
15	Prognostication	ES6	Recognize in a timely fashion when further clinical intervention is futile	B
		ES15	Elicit the patient's goals of care prior to initiating emergency stabilization, including evaluating the validity of advanced directives	B
		PE6	Educate patients on the natural course of their disease and impact of possible treatment in relation to prognosis	B
		TC11	Determine, summarize, and communicate the diagnosis or diagnostic uncertainty, anticipated course, prognosis, disposition plan, medications, future diagnostic/therapeutic interventions, signs and symptoms for which to seek further care and follow-up to patient or surrogate	B
17	Rapid palliative care assessment: a. aligning diagnostics and therapeutics to patient goals, b. functional, psychosocial, and spiritual assessment, c. assessing for and initiating hospice referrals, d. toolkits to help identify patient needs for appropriate referrals/resources, e. caregiver burden.	CS7	Consider the expectations of those who provide or receive care in the ED and use communication methods that minimize the potential for stress, conflict, and miscommunication	B

(*Continued on next page*)

Table 2. Continued.

	Hospice and palliative medicine competency	KSA code	Description	Level
20	Advance directives: a. physician order for life-sustaining treatment (POLST), b. medical order for life-sustaining treatment (MOLST), c. five wishes.	CS6	Elicit information from patients, families, and other healthcare members using verbal, nonverbal, written, and technological skills	D
		ES15	Elicit the patient's goals of care prior to initiating emergency stabilization, including evaluating the validity of advanced directives	B
21	Ethical and legal issues: a. decision-making capacity, b. futility.	CS15	Solicit patient participation in medical decision-making by discussing, risks, benefits, and alternatives to care provided	C
		ES6	Recognize in a timely fashion when further clinical intervention is futile	B
		LI12	Balance patient autonomy with patient protection and advocacy when addressing consent and refusal of care in accordance with legal and ethical standards	B
		TI9	Obtain informed consent from the patient or appropriate surrogate when indicated	B
22	Multidisciplinary team and support systems. (understanding team roles and system resources): a. spiritual chair, b. social chair, c. hospice care eligibility, d. continuing care, e. importance of local and community support systems.	TM1	Organize patient care teams	B
23	Transitions across care settings, eg, inpatient vs home hospice, palliative care unit	CS5	Communicate information to patients and families using verbal, nonverbal, written, and technological skills, and confirm understanding	B
		CS10	Communicate pertinent information to healthcare colleagues in effective and safe transitions of care	C
		TC11	Determine, summarize, and communicate the diagnosis or diagnostic uncertainty, anticipated course, prognosis, disposition plan, medications, future diagnostic/therapeutic interventions, signs and symptoms for which to seek further care and follow-up to patient or surrogate	B
		TC15	Ensure transitions of care are accurately and efficiently communicated between clinicians using best practices	B

Skills: Delivering bad news/Death Notifications and *20.1.1.3 Interpersonal and Communication Skills: Patient and family experience of care.*

Incorporation into the Knowledge, Skills and Abilities

Thirty items of 214 were tagged in the first round with 87% consensus (187/214) between the initial three independent reviewers on whether an item was or was not tagged as a match. Ten of the 23 HPM competencies (43%) mapped onto 16 different KSAs (Table 2). Of the 16 matches within the KSAs, none were advanced skills (level A). All but HPM 13 mapped onto at least one level B skill. A table showing all the HPM competencies and their incorporation within the EM Model and KSAs together is included as Supplemental Data A.

Potential Areas of Fit into the Knowledge, Skills and Abilities

Three additional KSAs were identified as having areas of potential fit or incorporation. *HPM 5: Caregiver support* and *HPM 12: Coping and self-care* could be taught while discussing *CS2: Establish rapport with and demonstrate*

empathy toward patients and their families. Finally, *HPM 16: Screening for palliative care needs* could be taught with *TC18: Correctly determine the appropriate disposition*.

DISCUSSION

This study showed fair to good inclusion of HPM competencies within the published EM KSAs and EM Model, demonstrating that the HPM competencies are represented in the Milestones. However, key topic areas were identified that could improve the focus of EM training in HPM. Demonstrating the overlap of the HPM and EM content may help EM educators ensure that HPM training is incorporated into their curriculums. Lack of training on these topics is a consistent finding in national and international studies, and educators need better ways to incorporate HPM-EM training into residency curriculums.[3–7,11–13] Improved teaching of the HPM-EM competencies has the potential to decrease the care gaps seen in ED symptom management and end-of-life care, including lack of goals of care conversations for critically ill patients.[14,15]

A limitation of the HPM competencies is that they have not been externally assessed or investigated and are based on expert consensus. None of the initial four reviewers were involved in the development of the HPM competencies and they found them to almost all map onto the EM Model or identified places in the EM Model that could be expanded to include them more explicitly. Additionally, the HPM competencies that mapped onto KSAs all met at least one KSA on the minimal competency level. These findings imply that the HPM competencies are skills that are at resident level.

The descriptions in the HPM competencies can add depth to the corresponding EM Milestones for curriculum development and summative evaluation. For example, most residencies provide training or simulations of mass casualty care. The study group envisioned ways in which end-of-life management could be added into that training (HPM 13). Likewise, a lecture on post-cardiac arrest care could incorporate training on the non-initiation or compassionate discontinuation of interventions such as mechanical ventilation (HPM 6). Summative competency assessments at end of training to gain board certification could also incorporate more HPM competency-based questions.

Much of the overlap between the HPM competencies and the EM Model and KSAs was in *Interpersonal and Communication Skills* (EM Model) and the *CS – Communication & Interpersonal Skills* (KSAs). Communication skills, although challenging to teach, are critical in patient-centered care and will likely have an increased emphasis as artificial intelligence and machine learning become more universally integrated into clinical care. Current models for communication instruction rely heavily on role modeling.[16] Residents have suggested that formal training in communication should focus on general communication skills and should provide syntax to use in future discussions.[17] Developing communication skills requires deliberate practice of techniques, including NURSE statements (naming, understanding, respecting, supporting, and exploring) and Ask-Tell-Ask.[17,18] Additionally, educators must become familiar with methods for real-time teaching of communication, such as "Could I add something?"[19]

Trajectories of dying (HPM 7) and prognostication (HPM 8) are two skills used to counsel patients/families with serious illness or at the end of life that did not fit clearly within the EM Model. These are difficult skills, and prior studies have identified some discordance between what families/caregivers understand about a person's death and the underlying causes of death identified by the physician-led team.[20] Thus, this skill should be honed throughout training. It is our experience that EM residents rarely receive explicit education on prognostication, and so we recommend its incorporation into curriculums. Our results further suggest that training on treating end-of-life symptoms, care for the imminently dying, and caring for patients under hospice care could be overlooked by current resident curriculums with strict adherence to the EM Model.

LIMITATIONS

A limitation of this project is that even though a consensus process was used with experts in residency education and HPM, other education experts may interpret the domains and competencies differently. For example, the *EM Model item 20.3.4.6 Well-being and Resilience - Care for the caregiver* was matched to HPM 5 and 17 about patient caregivers. However, this could also be interpreted as resident self-care as it is under the well-being section. Finally, while trained HPM emergency physicians reviewed all the mapping, the initial mapping did include resident input. This could be considered an advantage, as they are experiencing lectures weekly, or are a potential source of bias, as they have not had a full EM curriculum yet.

CONCLUSION

We identified areas of overlap where the HPM-EM subspecialty competencies can be emphasized or integrated into EM Model-based residency curriculums. This knowledge can be used for curriculum planning and incorporating HPM into definitions for competency in EM. These could also be reflected in final summative evaluations for certification.

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Staffing Patterns of Non-ACGME Fellowships with 4-Year Residency Programs: A National Survey

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Introduction: Emergency medicine (EM) is one of few specialties with variable training lengths. Hiring a three-year graduate to continue fellowship training in a department that supports a four-year residency program can lead to conflicts around resident supervision. We sought to understand hiring and clinical supervision, or staffing, patterns of non-Accreditation Council for Graduate Medical Education (ACGME) fellowships hosted at institutions supporting four-year residency programs.

Methods: We performed a web-based, cross-sectional survey of non-ACGME fellowship directors (FD) hosted at institutions supporting four-year EM residency programs. We calculated descriptive statistics. Our primary outcome was the proportion of programs with four-year EM residencies that hire non-ACGME fellows graduating from three-year EM residencies.

Results: Of 119 eligible FDs, 88 (74%) completed the survey. Seventy FDs (80%) indicated that they hire graduates of three-year residencies. Fifty-six (80%) indicated that three-year graduates supervise residents. Most FDs (74%) indicated no additional requirements exist to supervise residents outside of being hired as faculty. The FDs cited department policy, concerns about quality and length of training, and resident complaints as reasons for not hiring three-year graduates. A majority (10/18, 56%) noted that not hiring fellows from three-year programs negatively impacts recruitment and gives them access to a smaller applicant pool.

Conclusion: Most non-ACGME fellowships at institutions with four-year EM programs recruit three-year graduates and allow them to supervise residents. This survey provides programs information on how comparable fellowships recruit and staff their departments, which may inform policies that fit the needs of their learners, the fellowship, and the department. [West J Emerg Med. 2024;25(4.1)27–32.]

INTRODUCTION

Emergency medicine (EM) is one of few specialties in the United States with variable training lengths.[1,2] Most residencies implement a three-year model, while only 20% implement a four-year model.[3–5] There is little data to support either training length.[3–7] Some argue that four-year graduates have more time to gain confidence, develop procedural skills, develop academic interests, and gain experience supervising learners. Advocates of three-year programs argue that an extra year as faculty would provide these same experiences.[1,8,9] These personal biases may impact recruitment and hiring of

three-year graduates at institutions supporting four-year residency programs.[6,7]

When an institution hosting a four-year residency hires a three-year graduate into fellowship training, this can lead to conflicts around clinical supervision, or staffing, of residents related to perceptions of seniority and quality of training.[1,9] There are currently no best practices or guidelines to inform programs on how to address this situation. The situation is further complicated as non-Accreditation Council for Medical Education (ACGME) fellowships frequently lack uniform rules that govern recruitment, program requirements, and clinical responsibilities.[10] No studies currently evaluate the prevalence of these issues or examine variability in recruitment, hiring, and clinical responsibilities of trainees at non-ACGME fellowships. In this study, we sought to understand the hiring and staffing patterns of non-ACGME fellowships hosted at institutions with four-year EM residency programs.

METHODS

Study Design and Participants

This was a cross-sectional survey of fellowship directors (FD) of non-ACGME fellowships hosted at institutions supporting a four-year EM residency program. We conducted the survey between January–April 2023. This study was deemed exempt by our institutional review board (HUM00221519). In November 2022, we generated a list of 54 four-year EM residency programs from the Emergency Medicine Residents' Association (EMRA) Match roster and Electronic Residency Application Service directory.[11–13] We identified non-ACGME fellowships offered using each program's webpage, the Society for Academic Emergency Medicine Fellowship Directory, and the Society for Clinical Ultrasound Fellowships directory.[14,15]

Survey Development and Distribution

We developed the survey based on Panacek's general survey principles, literature review, and expert opinion to provide content validity evidence.[6,16–18] All authors have experience developing survey studies, and the group (including four current or former FDs) iteratively piloted and revised the survey for optimal phrasing, survey length, functionality, and appropriate mix of suggested and open-ended responses, which provided content and response process validity evidence.[18] We used Qualtrics (Qualtrics XM, Provo, UT), a web-based survey platform, to distribute the survey via email with a personalized link for each FD to collect and analyze the data. We sent weekly reminders to FDs' institutional emails, with an option to decline participation, for eight weeks. We then sent personalized weekly reminder emails for an additional four weeks. We collected individual responses to the survey anonymously.

Outcomes and Data Analysis

We asked FDs to report their fellowship type, years in current role, and demographic data such as number of clinical sites, program environment (academic, county, community, etc), and geographic location. Our primary outcome was the proportion of programs affiliated with four-year EM residencies that hire non-ACGME fellows graduating from three-year EM residencies. We also asked clarifying questions to better understand their staffing model, and recruiting, hiring, and clinical oversight policies. The survey included space for comments so that the FDs could provide context to their answers, but we did not analyze these for themes. The full survey is available in Appendix A1. We analyzed the data using Excel 365 (Microsoft Corporation, Redmond, WA) to generate descriptive statistics and analysis. We assessed the association between categorical variables using the Fisher exact test. We did not calculate an a priori sample-size estimate as we attempted to capture a 100% response rate.

RESULTS

Of 54 four-year EM residencies in the US, 32 institutions offered at least one non-ACGME fellowship with a total of 128 fellowships identified (median 3.5; range 1–10). We received 88 responses after excluding nine opt-outs and one blank response (88/119) for a response rate of 73.9%. Program and FD characteristics are listed in the Table. Free text responses are included in Appendix A2.

Of the 88 responses, 70 FDs (80%) reported hiring graduates of three-year EM programs for their respective fellowships. Fifty-six FDs (80%) who accept three-year graduates indicated that their fellows can supervise EM residents. We found variation in who fellows could supervise. The most common policy (40%) was that fellows can supervise EM postgraduate-year (PGY)-3 residents and below. Most FDs (74%) indicated that they had no additional requirements to supervise residents outside of being hired on as faculty. Full survey results appear in the Figure.

Programs with multiple clinical sites are more likely to hire three-year graduates. Ten of 23 programs (57%) with one clinical staffing site hired three-year graduates compared to 88% (57/65) of sites with two or more clinical sites ($P < 0.001$). The FDs reported the implementation of various strategies to mitigate potential conflicts. One program hosts a joint fellowship curriculum for their fellows, which incorporates instruction on bedside teaching, giving feedback, and teaching various skills. Other FDs reported that their programs prevented their fellows from staffing in high acuity areas or delay working with residents.

Twenty-seven FDs (50%) cited department policy as the reason for their hiring and staffing policies. Selected comments from other FDs included concerns about quality and length of training and resident complaints. Others

Table. Demographic details of the fellowships represented in our survey of fellowship directors of non-ACGME fellowship programs.

Demographics	Number of responses (%)
Fellowship type	
Admin/operations	14 (15%)
Cardiology and resuscitation	1 (1%)
Climate and health policy	1 (1%)
Digital health	1 (1%)
Disaster medicine	3 (3%)
Global health/international medicine	7 (7%)
Health humanities	1 (1%)
Health policy	1 (1%)
Medical education	18 (19%)
Neurologic emergencies	1 (1%)
Pediatric ultrasound	1 (1%)
Physician wellness	1 (1%)
Research	9 (9%)
Simulation	5 (5%)
Social medicine	3 (3%)
Ultrasound	22 (23%)
Wilderness medicine	3 (3%)
Program region	
Central (IL, IN, IA, KS, MI, MN, MO, NE, OH, WI)	13 (15%)
Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	45 (51%)
Southern (AL, AR, FL, GA, KY, LA, MS, NC, OK, PR, SC, TN, TX, VA, WV)	0 (0%)
Western (AZ, CA, CO, NM, NV, OR, UT, WA)	30 (34%)
Category of primary residency site*	
Academic (university based)	81 (82%)
Community	0 (0%)
County	15 (15%)
Other	3 (3%)
Category of non-ACGME fellow's primary clinical site*	
Academic (university based)	74 (46%)
Community	46 (29%)
County	23 (14%)
Other	17 (11%)
Number of clinical sites non-ACGME fellows clinically staff	
1	22 (25%)
2	33 (38%)
3	26 (30%)
4	6 (7%)

*Respondents could select more than one type of clinical site.

reported their clinical environment was not conducive to separating fellows from residents. Seven FDs reported wanting to avoid PGY-4 fellows staffing PGY-4 residents. One FD indicated that "because we are a 4-year program, we want to acknowledge to our residents that 4 years is what we think is required for graduation."

Among the programs not hiring fellows from three-year programs, 56% (10/18) of FDs noted that this policy

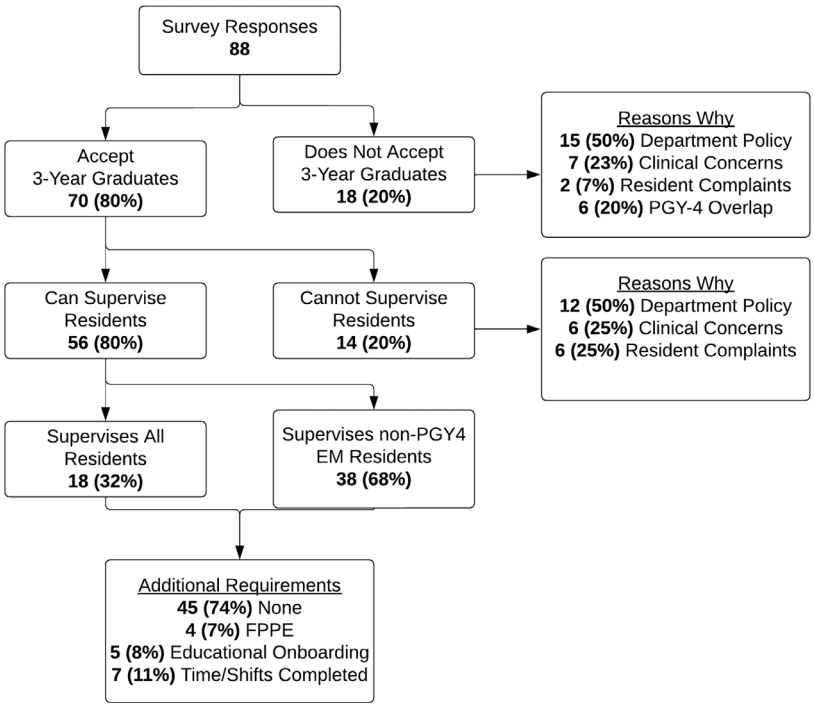

Figure. Flow diagram detailing the survey response hierarchy of fellowship directors of non-Accreditation Council for Graduate Medical Education fellowships regarding clinical supervision patterns for 3-year emergency medicine (EM) residency graduates at institutions with a 4-year EM program.
EM, emergency medicine; *PGY*, postgraduate year; *FPPE*, focused professional practice evaluation.

negatively impacted their fellowship recruitment and gave them access to a smaller pool of applicants.

DISCUSSION

To our knowledge this study is the first to describe staffing patterns of non-ACGME fellowships hosted at institutions with four-year EM residencies. Most of the FDs we surveyed hire three-year graduates as fellows, and most programs permit three-year graduates to staff residents with no additional requirements beyond being hired. We also identified potential negative impacts on fellowships as they restrict their applicant pool. One FD indicated that their fellowship was mostly going unfilled due to their recruitment policy. Another indicated that the financial sacrifice of a four- vs three-year residency may unintentionally favor recruitment of those without financial need or burden, especially since the debt load of EM applicants is reportedly higher than for other medical specialties.[1]

Some programs offer their fellows alternative clinical sites – such as Veterans Affairs hospitals, freestanding EDs, or urgent cares. By staffing multiple locations, non-ACGME fellows can work without a resident presence. This flexibility allows programs to hire three-year graduates and permits fellows to interface with residents academically without having to supervise them clinically. This allows for a training environment conducive to the needs of all learners' growth and development.

The FDs cited clinical concerns and department policy as the main reasons for their staffing and hiring policies. There is a lack of objective data that four-year graduates outperform three-year graduates clinically or on the qualifying written board exam, suggesting that this may be rooted in bias.[1,6,7] In the absence of robust data to support the clinical capabilities of trainees from either three- or four-year programs, the principles of competency-based medical education (CBME) may offer solutions.[19] The principles of CBME require demonstration of competency and decouple attainment of competency from time-in-training.[19] The use of CBME to determine readiness for unsupervised practice through a process known as "promotion in place" has been piloted by some residency programs and may be a useful model to replicate in determining fellow readiness for staffing, regardless of PGY status.[19,20] If we remove the focus from time-bounded training and focus on demonstrated skill acquisition, programs may design processes to onboard three-year graduates by focusing on developing and assessing appropriate skills for supervision of trainees.

Future studies could explore who sets departmental policies regarding fellow staffing, evaluate fellow and resident perceptions of staffing policies, and compare

career outcomes of fellows working in various staffing environments.

LIMITATIONS

We may not have captured all non-ACGME fellowships at four-year institutions. We did not identify fellowship directories besides ultrasound, which may have led to sampling bias. We attempted to mitigate this by searching specific program websites for listed fellowships. The FDs who did not participate in our study may represent a unique population with different hiring and staffing patterns. We did not identify non-ACGME fellowships hosted at four-year EM programs in the southern US, nor did we receive responses from primarily community EM programs, which could also have biased our results. We did not survey ACGME-accredited fellowships, as fellows vary in the way they "maintain their primary Board skills."[21] Some ACGME fellowships (eg, critical care, emergency medical services) do not require minimum clinical hours in the emergency department, which leads to a qualitatively different experience from non-ACGME fellowships, where fellows are appointed as clinical faculty.[2,21,22]

CONCLUSION

Our results indicate that most non-ACGME fellowships hosted at institutions with four-year EM programs recruit graduates of three-year programs and allow them to supervise residents. This survey data provides program information on how comparable fellowship programs recruit and staff their departments, which may inform policies that fit the needs of their learners.

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Nudge Theory: Effectiveness in Increasing Emergency Department Faculty Completion of Residency Assessments

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BACKGROUND

Assessments are a core component of residency training to assess development in the general competencies expected of all physicians.[1] Many methods are employed to evaluate performance, from checklists to computer-based questionnaires, as no single best practice exists.[2] Common to most, however, are barriers to the completion of assessments.[3] For example, residents and faculty often cite a perceived lack of time to perform assessments, which may lead to suboptimal compliance in completing assessments.[3] Some methods of assessment, such as providing narrative feedback to residents by faculty, may be seen as too burdensome.[3] The emergency department represents an especially challenging environment to overcome these barriers given the high cognitive demand placed on faculty and residents by default.

One possible strategy to enhance faculty compliance in completing assessments is to implement behavioral nudging into social and physical environments. Borrowed from behavioral economics, nudge theory involves use of evidence-based "nudges" that incorporate positive reinforcement and indirect suggestions to influence decisions and behavior.[4] Nudges can include use of the following: priming (environmental cues to subconsciously drive behavior); default options (desirable options are preselected as the default choice and thereby easiest for individuals to take); norm-based nudges (comparing individual behavior to peer practice); commitment (making a public promise to complete a task); and salience (drawing attention to a particular option through colors or a compelling story), among others.[4] For instance, in the surgical intensive care unit, hand hygiene compliance was enhanced when individuals were primed with a citrus-like fragrance that was dispensed into the environment.[5] In another example, medical student assessments were completed more often when faculty were prompted with electronic forms at the end of shifts, rather than relying on them to complete paper forms at their own discretion.[6] In this study, we evaluated the effectiveness of two priming nudges and one norm-based nudge in increasing compliance of faculty in completing assessments of emergency medicine residents.

OBJECTIVES

Our primary objective in the study was to assess the effectiveness of nudge interventions in increasing the number of resident performance assessments completed by attending physicians. This was assessed by comparing the number of assessments completed during the year prior to implementation of the nudge interventions with the years following their implementation. Our secondary objective was to identify which particular method was employed with the greatest frequency.

CURRICULAR DESIGN

This project qualified as a research study conducted in established or commonly accepted educational settings. The Research Oversight Committee approved the Institutional Review Board Exempt Review Form request for exemption. The study took place at Riverside Community Hospital, a tertiary-care referral academic/community medical center in Riverside, California. The residency program at Riverside Community Hospital is a three-year emergency medicine residency accredited by the Accreditation Council for Graduate Medical Education. Each class has 13 residents per year for a total of 39 residents. We had approximately 28–30 faculty during the study, and 28 faculty received prior training on completing end-of-shift assessments.

We collected pre-intervention data from July 1, 2019–June 30, 2020 with an email link sent to faculty at the beginning of the academic year. They were sent periodic email reminders to complete the survey. The intervention started on July 1, 2020. The post-intervention data was collected from July 1, 2020–May 11, 2021.

Table. Number of assessments completed over time charted against timeline of interventions.

Time frame	7/1/19–6/30/20 (pre-intervention)	7/1/20–6/20/21 (post-intervention)	7/1/21–6/1/22 (post-intervention)
Number of responses	3,663	4,243	4,534
Evaluations per month	305	354	453

Three primary nudges were used as the intervention to increase the number of end-of-shift assessments. We selected the nudges based on previous studies, which showed people change behavior based on social comparison.[7] People also tend to choose the most visible option.[8] The first nudge was to create a homepage on the faculty phone with a direct link to the end-of-shift assessment survey. The second nudge was a quick response (QR) code posted at the faculty work stations throughout the department: in the main ED; in the rapid care (lower acuity) zone; and in the faculty break room. The third nudge was based on a social proof heuristic. At the end of each block an email was sent to all faculty with the total number of assessments completed for the block, with comparisons to other faculty members' completion rate and a link to the survey.

At the end of the study period, all faculty received a survey asking which nudge was used the most often. Faculty were asked to rank each intervention, from used most often (weighted score of 3) to least often (weighted score of 1). The survey link in the email reminder was created in Surveymonkey.com (Momentive, San Mateo, CA). We created the QR code flyer on canva.com (Surry Hills, Australia).

We believe that the interventions in this study can be replicated at many other institutions. The QR code should be posted in highly visible locations near the faculty workspace in the ED. We discovered that many faculty members required detailed instructions on how to create a homepage on their mobile devices. However, the faculty reported that once the homepage was set up, it was the easiest way to complete the assessments. The end-of-the-block summary of the total number of assessments completed by faculty may be an administrative burden to some institutions.

IMPACT/EFFECTIVENESS

As shown in Table 1, there was a 15.8% increase in the number of assessments completed in the year after these interventions were implemented, with the number of completed assessments increasing from 3,663 (305 assessments per month) in the pre-intervention year to 4,243 (354 assessments per month) in the first post-intervention year. This increase was sustained in the following year, with 4,534 assessments (453 assessments per month) completed to date. This trend suggests that our "nudge" interventions may have been effective in producing a long-term change in faculty behavior patterns.

When surveying the 28 faculty to determine which nudge was most effective, there was an 85.7% (24) response rate. Of the respondents, 19 (79%) indicated that their most frequently used nudge was the survey link saved onto their phone, and that they completed over 75% of their assessments this way. Thirteen respondents (54%) reported that the nudge based on social heuristics—the link at the end of the monthly emails—was the second most frequently used. Only one respondent used the QR code flyers most frequently, and 20 (83%) stated they never used the QR code at all.

From our experimental design, we learned that nudges used online could be effective in increasing completion rates of assessments. A surprising limitation was the grouping of data into certain time frames, which could be delineated in future iterations to determine the impact that time of year has on response rates. We could also compare efficacies of different interventions, such as comparing a baseline rate of using home-screen survey links only to this baseline plus an added intervention, to assess the importance of each added variable and help determine which interventions truly provide benefit.

This assessment of our interventions' impact is limited by several factors. As the number and makeup of faculty changed during the intervention, it was not possible to determine whether a statistically significant number of faculty changed their practice as a result of this intervention. The increase in the assessment completion rate may also be due not only to our interventions but also to outside factors such as changing hospital policies, number of faculty, the impact of the COVID-19 pandemic, overall departmental shifts in attitude, or the Hawthorne effect, any of which may have played a role in influencing behavior. It is also difficult to distinguish which of the various interventions actually impacted attending behavior, as all were implemented simultaneously, and survey replies were anonymous and may be subject to recall bias. For example, it is possible that the presence of QR codes at workstations was responsible for the large increase in phone home-screen assessment completion.

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The Effect of a Simulation-based Intervention on Emergency Medicine Resident Management of Early Pregnancy Loss

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Background: The evaluation of patients with first-trimester vaginal bleeding and concern for early pregnancy loss (EPL) frequently occurs in the emergency department (ED), accounting for approximately 1.6% of all ED visits.[1] Unfortunately, these patients consistently report negative experiences with ED care.[2–8] In addition to environmental concerns, such as long wait times, patients often describe negative interactions with staff, including a perceived lack of empathy, the use of insensitive language, and inadequate counseling.[2,3] These patients and their partners often view EPL as a traumatic loss of life and commonly experience prolonged grief reactions, including anxiety and depression.[9–11] Poor satisfaction with care has been associated with worse mental health outcomes.[12] These complaints represent an important opportunity for improvement in emergency medicine (EM) training.[13]

While no published literature to date describes the performance of EM residents in managing patients presenting with EPL, studies suggest that even obstetrics and gynecology (OB/GYN) residents find these interactions challenging.[14,15] Simulation- and didactic-based training has been shown to be beneficial in improving OB/GYN resident EPL counseling and has been associated with improved patient outcomes.[16] To our knowledge, this has yet to be replicated in EM residency training.

Objectives: We aimed to develop and evaluate a simulation-based educational intervention to improve EM resident management of patients presenting with EPL. [West J Emerg Med. 2024;25(4.1)36–40.]

CURRICULAR DESIGN

The educational intervention consisted of three phases (Figure 1) and was designed to optimize learning based on Kolb's learning cycle.[17,18] Residents were presented with a challenging scenario (concrete experience) and then prompted to reflect on areas for improvement (reflective observation). They then completed an asynchronous module followed by an interactive group discussion (abstract conceptualization). The learning cycle continued through active experimentation via a repeated opportunity to do the simulation, followed by debriefing. This form of repetitive simulation has been shown to be more effective when compared with non-repeated simulation.[19,20]

We implemented the intervention in May 2023 and conducted a pre/post study of its immediate impact, which was deemed exempt by our institutional review board. The intervention took place at the simulation center of the affiliated medical school, during the two-hour period typically allotted for monthly resident simulation-based education. Postgraduate year (PGY) 1–3 EM residents were recruited based on a convenience sample including all residents attending simulation that day. The residents were not informed of the topic of the intervention prior to the day of the study, which is typical of our simulation curriculum.

Six standardized patients (SP) were hired to portray patients experiencing EPL. Six volunteer faculty emergency physicians (two men, four women) observed and evaluated the simulations and provided instruction and debriefing. One faculty OB/GYN physician and one faculty emergency

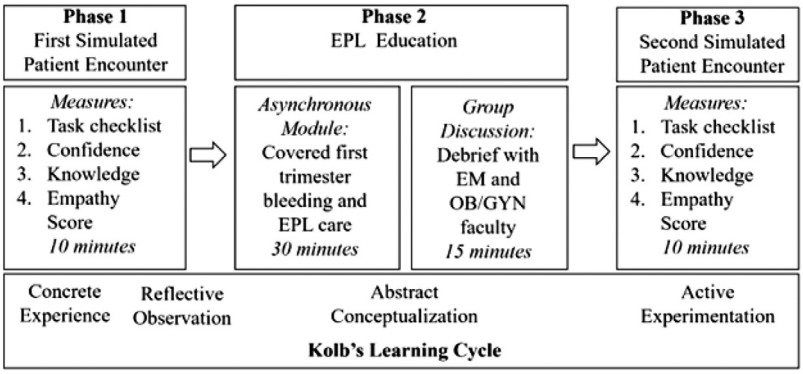

Figure 1. Sequence of an educational intervention for early pregnancy loss counseling.
EPL, early pregnancy loss.

physician (both women) co-facilitated the guided group discussion-based education.

First, residents participated in a 10-minute simulated patient encounter in which they were instructed to care for a SP who portrayed a patient who was eight weeks pregnant and presented with vaginal bleeding. Prior to evaluating the patient, each resident was provided with ultrasound results indicating the pregnancy was nonviable (presumably obtained in triage).

Following the encounter, residents individually debriefed with an EM faculty observer. Residents then had 30 minutes to complete an asynchronous online educational module that included content about the assessment of early pregnancy bleeding; diagnosing and managing ectopic pregnancy; preventing alloimmunization; and EPL counseling. Particular attention was paid to optimizing care to address a patient's physical, emotional, and cognitive needs, a framework recommended by Emond et al.[21] The module was delivered via an interactive educational platform, Rise 360 Articulate (Articulate, New York, NY).[22] After completing the module, residents participated in a 15-minute guided group dialog with EM and OB/GYN faculty, discussing best practices and modeling practical communication skills. Facilitators gave examples of how they would address patients in various scenarios to communicate clearly while also using sensitive language.

Following this discussion, residents repeated the same 10-minute simulated patient encounter followed by individual debriefing with EM faculty. The intervention was designed to accommodate up to 24 residents with the resources described.

IMPACT AND EFFECTIVENESS

To study the immediate impact of the intervention, resident performance was evaluated using four measures: 1) completion of critical actions during the simulation via an 11-item checklist; 2) self-reported confidence; 3) a 10-item multiple-choice test of foundational EPL knowledge; and 4) SP perceptions of resident empathy during the simulation via the modified Jefferson Scale of Empathy (JSE).[23,24] All four evaluative measures were delivered immediately following the initial simulated encounter (Phase 1) and after the final simulation encounter (Phase 3). In addition to these measures, residents were invited to participate in a brief focus group interview, conducted by a non-faculty facilitator (woman), after the intervention to discuss their impressions of the intervention.

Faculty in EM and OB/GYN developed the task checklist to include critical actions and evidence-based best practices in treating patients experiencing EPL. This list was adapted from a checklist employed in a similar study and modified to reflect ED care.[25] Residents were asked to rate their perceived confidence level from least (1) to most (10) confident regarding the following: knowledge about the evaluation and management of patients with first-trimester bleeding; ability to communicate in a sensitive and empathic manner with patients with EPL; and ability to counsel a patient experiencing EPL regarding what to expect after discharge. They also completed a 10-question multiple-choice test, which EM and OB/GYN faculty developed to assess basic objective knowledge. After each simulated encounter, SPs completed the modified JSE, a validated tool for SP evaluation of clinician empathy and communication. The modified JSE includes five questions on a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7).[23,24] An outline of the simulated case, the module, and the assessment tools are included in the supplemental material accompanying the online article.

Of the 16 residents who participated, 75% identified as men, and there was relatively equal representation of PGY-1 (31.3%), PGY-2 (37.5%), and PGY-3 (31.3%) residents. Residents improved from pre- to post-intervention across all four evaluative measures (Table 1). Before the intervention, few residents provided information about what to expect after discharge, including the potential pain level, the likelihood of passing tissue, return precautions, and long-term emotional ramifications. After the intervention, residents were significantly more likely to use sensitive

Table 1. Resident assessment outcomes pre- to post-intervention.

		Pre	Post	Signed rank	
Measure	**Maximum score**	**Mean (SD)**	**Mean (SD)**	***S***	***P*-value**
Performance checklist	11	4.94 (1.80)	9.50 (1.51)	67.0	<.001
Self-confidence	30	20.06 (3.38)	24.69 (3.50)	68.0	<.001
Knowledge	10	5.84 (1.29)	8.00 (1.41)	45.5	<.001
Empathy	35	21.25 (6.04)	28.06 (5.47)	65.5	<.001

Table 1b. Resident checklist performance.

Checklist item	**Pre n (%)**	**Post n (%)**	***P*-value**
1. Delivers bad news using simple language and with avoidance of non-preferred terms (fetus, embryo)	10 (62.5)	16 (100)	0.03
2. Allows silence for the patient to absorb the news	14 (87.5)	14 (87.5)	1.00
3. Acknowledges patient's emotions	15 (93.8)	15 (93.8)	1.00
4. Dispels guilt	15 (93.8)	16 (100)	1.00
5. Counsels patient about the amount of expected bleeding	2 (12.5)	11 (68.8)	0.004
6. Counsels patient on expected pain	1 (6.3)	10 (62.5)	0.004
7. Counsels patient on the possibility of passing tissue	2 (12.5)	12 (75.0)	0.006
8. Counsels patient on return for severe bleeding	3 (18.8)	14 (87.5)	0.003
9. Counsels patient on return for fever	2 (12.5)	15 (93.8)	0.001
10. Normalizes emotional ramifications of EPL	5 (31.3)	13 (81.3)	0.008
11. Discusses follow-up plan	10 (62.5)	16 (100)	0.030

EPL, early pregnancy loss.

language and to include information about expected outcomes and return precautions (Table 1b).

These results indicate that focused training resulted in immediate improvements in resident performance, particularly regarding counseling and communication. Given the positive results of similar interventions undertaken in other learner populations, this immediate impact likely indicates improved ability to care for patients in clinical practice. Verhaeghe et al published the impact of a three-hour in-situ simulation training for OB/GYN residents, which resulted in long-term improvements in psychologic outcomes as well as reduced need for return visits.[16] As compared to these previous interventions, our curriculum enhanced efficiency by employing an online training module, which covered additional foundational knowledge of early pregnancy bleeding care (including ectopic pregnancy and threatened EPL). This efficiency is particularly important in EM given the breadth of required knowledge.

While the eight residents who participated in the focus group interview generally reported positive feedback, two residents did note that they were confused by the order of the simulation such that they had a diagnosis prior to any interaction with the patient. In the future, this may be ameliorated by providing the residents with more context to the case or simply revising the scenario so that the ultrasound report is received after an initial evaluation and request for imaging. Additionally, the time allotted for the asynchronous module was 30 minutes, but most residents completed it in about 20 minutes, indicating the possibility of additional content or expansion of another aspect of the intervention.

LIMITATIONS AND CONCLUSION

This study describes resident performance in a simulated patient encounter, and we cannot conclude that this reflects actual clinical care. This study only assessed the impact of the training on learning (Kirkpatrick level 2) and did not attempt to evaluate the residents' ongoing clinical behavior or its effect on patients.[26] The study was conducted during one session and, therefore, we cannot infer information about retention of learning. Future work should assess the effect of interventions such as this on clinician behavior and resultant patient outcomes. Faculty evaluators were not blinded during the simulated patient encounters, which could have introduced bias into the evaluation provided via the checklist. This concern is somewhat addressed by the binary

nature of the checklist, in which either a task was performed or it was not. Of the assessment tools, only the modified JSE has been externally validated. Creating and validating EM-specific measurement tools for EPL care would ensure more robust data going forward.

"Participants disproportionately identified as men (75%), as compared to the national average in emergency residencies of 62%.[27] Given the small population from which the study sample was derived, we did not ask participants whether they were cis- or transgender to avoid loss of anonymity. Similarly, we did not ask participants about personal experiences with EPL. Future work could explore the relationship of these characteristics and experiences with clinical performance. Despite these limitations, the results of this study indicate a need for EPL-specific education in EM residency and that a brief, simulation-based intervention was effective in producing immediate improvements. Considering the results of similar studies conducted in other populations, an intervention such as this may result in improved clinical care and long-term patient outcomes in this common, but devastating, presentation.

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Integration of Geriatric Education Within the American Board of Emergency Medicine Model

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Background: Emergency medicine (EM) resident training is guided by the American Board of Emergency Medicine Model of the Clinical Practice of Emergency Medicine (EM Model) and the EM Milestones as developed based on the knowledge, skills, and abilities (KSA) list. These are consensus documents developed by a collaborative working group of seven national EM organizations. External experts in geriatric EM also developed competency recommendations for EM residency education in geriatrics, but these are not being taught in many residency programs. Our objective was to evaluate how the geriatric EM competencies integrate/overlap with the EM Model and KSAs to help residency programs include them in their educational curricula.

Methods: Trained emergency physicians independently mapped the geriatric resident competencies onto the 2019 EM Model items and the 2021 KSAs using Excel spreadsheets. Discrepancies were resolved by an independent reviewer with experience with the EM Model development and resident education, and the final mapping was reviewed by all team members.

Results: The EM Model included 77% (20/26) of the geriatric competencies. The KSAs included most of the geriatric competencies (81%, 21/26). All but one of the geriatric competencies mapped onto either the EM Model or the KSAs. Within the KSAs, most of the geriatric competencies mapped onto necessary level skills (ranked B, C, D, or E) with only five (8%) also mapping onto advanced skills (ranked A).

Conclusion: All but one of the geriatric EM competencies mapped to the current EM Model and KSAs. The geriatric competencies correspond to knowledge at all levels of training within the KSAs, from beginner to expert in EM. Educators in EM can use this mapping to integrate the geriatric competencies within their curriculums. [West J Emerg Med. 2024;25(4.1)41–50.]

INTRODUCTION

Emergency medicine (EM) residents have 3–4 years of training to learn an extensive array of skills. This includes the skills needed to care for older patients, who make up 16–20% of their patients.[1,2] The American Board of Emergency Medicine (ABEM) codifies the skills needed for competency in EM in the Model of the Clinical Practice of Emergency Medicine (EM Model) and the 2021 knowledge, skills, and abilities (KSA).[3,4] The EM Model lists clinical presentations and disease types and the KSAs are a list of skills and abilities integral to EM practice. Many residency programs base their curriculums on these documents. However, it is unclear how

best to integrate geriatric teaching within these complex curricula.

In 2010 Hogan et al published eight domains with 26 competencies of geriatric education derived from an expert consensus panel that are considered essential learning during EM residency for the care of older adults in the emergency department (ED).[5] These competencies are also used for categorizing geriatric continuing education for geriatric ED accreditation and have been pivotal to the development of geriatric EM as a subspecialty.[6,7] Despite this guidance, geriatric concepts are still only minimally integrated into resident education.[8] Without dedicated training, resident knowledge of geriatric competencies is poor.[9–11] But there is currently no guidance on how to integrate the geriatric competencies within an EM residency curriculum.

Our curriculum is based on the EM Model and KSAs. Our goal was to determine whether the geriatric competencies can be covered by an EM Model-based curriculum.

METHODS

This project is not human subjects research and did not require institutional board review. The study was a descriptive comparison of the 2019 EM Model and the 2021 KSAs to the 2010 geriatric competencies using a consensus-based process. The KSAs include both a description and a level. They are divided into overarching categories (eg, diagnosis, pharmacotherapy, reassessment) which are then divided into steps.[4] Each step is given a hierarchy in training (with A the highest and E the lowest). Level A is for advanced knowledge or skills. Level B is the minimal competency level for passing EM residency. Levels C, D, and E are skill steps to reach level B.

In the first phase of consensus mapping, two residents (a second-year EM resident and a fourth-year EM/internal medicine resident) and a geriatric fellowship-trained EM attending independently mapped geriatric competencies using Excel (Microsoft Corporation, Redmond WA). They were instructed to first use the search button to look for exact language and then go item by item through the EM Model and the KSAs to map similar language or concepts. For example, the concept of delirium could be described as altered mental status or encephalopathy. A clear association was defined by the team as 1) a keyword match or 2) consensus that it was likely that an emergency physician lecturing/teaching on the EM Model content item would, in normal teaching practices, teach the geriatric competency. If this was not the case, but the geriatric competency could be incorporated under this topic by someone *intentionally* teaching the competencies, this was listed as a suggested area for incorporation. Reviewers were instructed to be generous with mapping during this first round.

If all three or 2/3 agreed, this was considered initial consensus. Any remaining discrepancies were then independently reviewed by another emergency physician with expertise in resident education (former EM program director and current ABEM executive committee member). The full group met and reviewed the final discrepancies until consensus was reached. The consensus tables were then reviewed independently by two more emergency physicians at external residency programs for content validity. A similar process was used for mapping KSAs. Reviewers were blinded to the KSA level (A-E designation).

RESULTS

Incorporation into the 2019 EM Model

The EM Model has 963 items. On the first round, 126 items (13% of content) were identified as potential matches, including all of *17.1 Drug and Chemical Classes*. Round 1 consensus was 96.2% (927 items). Table 1 lists the 20 geriatric competencies (77%) included in the 2019 EM Model. Key word matches included competency #6: "*Demonstrate ability to recognize patterns of (physical/sexual, psychological, neglect/abandonment) that are consistent with elder abuse[,]"* which maps to "*Model Content 14.6.1.3 Patterns of Violence/Abuse/Neglect: Intrapersonal Violence: Elder*." Others were matched by concept, such as competency #11: "*Assess and correct (if appropriate) causative factors in agitated elders such as untreated pain, hypoxia, hypoglycemia, use of irritating tethers (defined as monitor leads, blood pressure cuff, pulse oximetry, intravenous access, and Foley catheter), environmental factors (light, temperature), and disorientation [,]"* which could be incorporated into teaching on *12.14 Nervous System Disorders: Delirium*.

Initial disagreements included whether signs and symptoms were meant to be used to formulate a differential diagnosis for that symptom or to describe management of the symptoms. There was also a question as to whether G11, which discusses "irritating tethers" as a cause of delirium, should be mapped to all procedures such as *19.4.1.4. Nasogastric tube*. The group decided that this would be better encompassed under the EM Model item for delirium. Table 2 lists the six geriatric competencies without a clear fit within the EM Model and suggestions from the team on where to include them.

Incorporation into the 2021 Knowledge, Skills, and Abilities

The initial independent mapping resulted in consensus on 84% of the items (179/214). Of the geriatric competencies, 216 (81%) mapped onto KSAs (Table 3). The most common categories were Communication & Interpersonal Skills (CS0), Pharmacotherapy (PT0), and Transitions of Care (TC0). Of the five competencies that did not map directly onto the KSAs, all had mapping items in the EM Model except one. The one competency that did not map directly to any EM Model or KSA was Effects of Comorbid Conditions (G24): "*Assess and document the presence of comorbid*

Table 1. The geriatric teaching competencies mapped onto the Emergency Medicine Model of Care.

Geriatric competency	Description	EM model item
G1	Generate a differential diagnosis recognizing that signs and symptoms such as pain and fever may be absent or less prominent in elders with acute coronary syndromes, acute abdomens, or infectious processes.	1.1 Abnormal vital signs 1.2 Pain
G2	Generate an age-specific differential diagnosis for elder patients presenting to the ED with general weakness, dizziness, falls, or altered mental status.	1.3.1 General- altered mental status 1.3.4 General- ataxia 1.3.19 General- fatigue/malaise 1.3.28 General- lightheadedness/dizziness 1.3.53 General- weakness 18.3.2 Multisystem trauma- falls
G3	Document consideration of adverse reactions to medications, including drug-drug and drug-disease interactions, as part of the initial differential diagnosis.	1.3.55 General- toxidromes 17.1 Drug and chemical classes: *entire section*
G4	In patients who have fallen, evaluate for precipitating causes of falls such as medications, alcohol use/abuse, gait or balance instability, medical illness, and/or deterioration of medical conditions.	1.3.4 General- ataxia 1.3.53 General- weakness 18.3.2 Multisystem trauma- falls
G5	Assess for gait instability in all ambulatory fallers; if present, ensure appropriate disposition and follow-up including attempt to reach primary care physician.	18.3.2 Multisystem trauma- falls
G6	Demonstrate ability to recognize patterns of trauma (physical/sexual, psychological, neglect/abandonment) that are consistent with elder abuse. Manage the abused patient in accordance with the rules of the state and institution.	14.6.1.3 Patterns of violence/abuse/neglect- elder
G7	Institute appropriate early monitoring and testing with the understanding that elders may present with muted signs and symptoms (eg, absent pain and neurologic changes) and are at risk for occult shock.	1.3.41 General- shock
G8	Assess whether an elder is able to give an accurate history, participate in determining the plan of care, and understand discharge instructions.	12.8.1 Other conditions of the brain-dementia 14.5.2 Organic psychoses- dementia 20.4.5.4 Regulatory/legal- consent, capacity and refusal of care
G9	Assess and document current mental status and any change from baseline in every elder, with special attention to determining whether delirium exists or has been superimposed on dementia.	1.3.1 General- altered mental status 12.8.1 Other conditions of the brain-dementia 12.14.1 Delirium- excited delirium syndrome 14.5.2 Organic psychoses- dementia
G10	Emergently evaluate and formulate an age-specific differential diagnosis for elders with new cognitive or behavioral impairment, including self-neglect; initiate a diagnostic workup to determine the etiology; and initiate treatment.	1.3.18 General- failure to thrive
G11	Assess and correct (if appropriate) causative factors in agitated elders such as untreated pain, hypoxia, hypoglycemia, use of irritating tethers (defined as monitor leads, blood pressure cuff, pulse oximetry, intravenous access, and Foley catheter), environmental factors (light, temperature), and disorientation.	12.14.1 Delirium- excited delirium syndrome

(*Continued on next page*)

Table 1. Continued.

Geriatric competency	Description	EM model item
G12	Recommend therapy based on the actual benefit to risk ratio, including but not limited to acute myocardial infarction, stroke, and sepsis, so that age alone does not exclude elders from any therapy.	12.11.1.1 Stroke- intracerebral hemorrhagic stroke 12.11.1.2 Stroke- subarachnoid hemorrhagic stroke 12.11.2.1 Stroke- embolic ischemic stroke 12.11.2.2 Stroke- thrombotic ischemic stroke 20.4.4.1 Health care coordination- advance directives
G14	Prescribe appropriate drugs and dosages considering the current medication, acute and chronic diagnoses, functional status, and knowledge of age-related physiologic changes (renal function, central nervous system sensitivity).	17.1 Drug and chemical classes: *entire section*
G15	Search for interactions and document reasons for use when prescribing drugs that present high risk either alone or in drug-drug or drug-disease interactions (eg, benzodiazepines, digoxin, insulin, NSAIDs, opioids, and warfarin).	17.1 Drug and chemical classes: *entire section*
G16	Explain all newly prescribed drugs to elders and caregivers at discharge, assuring that they understand how and why the drug should be taken, the possible side effects, and how and when the drug should be stopped.	20.1.1.3 Interpersonal skills- patient and family education
G19	With recognition of unique vulnerabilities in elders, assess and document suitability for discharge considering the ED diagnosis, including cognitive function, the ability in ambulatory patients to ambulate safely, availability of appropriate nutrition/social support, and the availability of access to appropriate follow-up therapies.	20.3.2.6 Ethical principles- care of vulnerable populations 20.4.4.3.1 Healthcare coordination- activities of daily living/functional assessment
G20	Select and document the rationale for the most appropriate available disposition (home, extended care facility, hospital) with the least risk of the many complications commonly occurring in elders during inpatient hospitalizations.	20.4.4.2.3 Healthcare coordination- hospice referral
G21	Rapidly establish and document an elder's goals of care for those with a serious or life-threatening condition and manage accordingly.	20.4.4.1 Healthcare coordination- advance directives 20.4.4.2.1 Healthcare coordination- patient identification for palliative care
G22	Assess and provide ED management for pain and key non-pain symptoms based on the patient's goals of care.	19.3.3 Anesthesia and acute pain management- analgesia
G23	Know how to access hospice care and how to manage elders in hospice care while in the ED.	20.4.4.2.3 Healthcare coordination- hospice referral

NSAID, non-steroid anti-inflammatory drug; *ED*, emergency department.

conditions (eg, pressure ulcers, cognitive status, falls in the past year, ability to walk and transfer, renal function, and social support) and include them in your medical decision-making and plan of care." Incorporating the potential consequences of comorbid conditions is included in KSA PR2: "*Perform the indicated procedure on an uncooperative patient, patient at the extremes of age (pediatric, geriatric), multiple co-morbidities, poorly defined anatomy, hemodynamically unstable, high risk for pain or procedural complications, sedation required, or emergent indication to perform procedure, and recognize the outcome and/or complications resulting from the procedure*" (KSA Level B). While the geriatrics competency addresses medical decision-making and the KSA address difficult procedures, there is some overlap in the training required.

Of the 63 matches within the KSA, five (8%) mapped onto advanced level A skills (*DX7, Identify obscure, occult, or rare patient conditions*; and *TI6, Develop protocols to avoid potential complications of interventions*). About half (31, 49%) mapped onto required competency skills (Level B), and the remaining 27 (43%) were developing skills (Level C, D or E, 27, 43%) (Table 3).

Table 2. Suggestions for teaching the geriatric competencies that do not fit clearly within the Emergency Medicine Model.

Geriatric competency	Description	Suggestions for teaching geriatric competencies without a clear association with EM Model items
G13	Identify and implement measures that protect elders from developing iatrogenic complications common to the ED including invasive bladder catheterization, spinal immobilization, and central line placement.	Could be discussed under *Procedure Domain* or *Practice-based Learning and Improvement: Patient safety and Medical errors*
G17	Document history obtained from skilled nursing or extended care facilities of the acute events necessitating ED transfer including goals of visit, medical history, medications, allergies, cognitive and functional status, advance care plan, and responsible PCP.	No transitions of care, nursing facility, or disposition areas. Could be taught under *Interpersonal and Communication Skills: Intra-departmental relations, teamwork, and collaboration skills*.
G18	Provide skilled nursing or extended care facilities and/or PCP with ED visit summary and plan of care, including follow-up when appropriate.	No transitions of care, nursing facility, or disposition areas. Could be taught under *Interpersonal and Communication Skills: Intra-departmental relations, teamwork, and collaboration skills*.
G24	Assess and document the presence of comorbid conditions (eg, pressure ulcers, cognitive status, falls in the past year, ability to walk and transfer, renal function, and social support) and include them in your medical decision-making and plan of care.	While individual elements listed are in the model (eg, ulcerative lesions: decubitus), the concept of comorbidity in older adults is distinct from disease-oriented items.
G25	Develop plans of care that anticipate and monitor for predictable complications in the patient's condition (eg, gastrointestinal bleed causing ischemia).	Could be discussed under *Practice-based Learning and Improvement: Patient safety and Medical Errors*.
G26	Communicate with patients with hearing/sight impairment	Could be discussed under *Interpersonal and Communication Skills: Cultural Competency.*

ED, emergency department; *PCP*, primary care physician.

DISCUSSION

The geriatric competencies for EM residency training integrate well within the EM Model and KSAs, with only one competency not having a direct match. Demonstrating this overlap between the suggested subspecialty curriculum and the EM model can help EM educators ensure that the geriatric competencies are incorporated into their curricula. This mapping could also guide the development of board exam questions, lectures, or simulation cases.

The EM Model is very brief, which can make directing education difficult. For instance, training on the EM Model item *18.3 Multi-system Trauma: Falls* is expounded upon in geriatric competency #4: "*In patients who have fallen, evaluate for precipitating causes of falls such as medications, alcohol use/abuse, gait or balance instability, medical illness, and/or deterioration of medical conditions*." Or another example, KSA *DX1 "Synthesize chief complaint, history, physical examination, and available medical information to develop a differential diagnosis*" can include a discussion of geriatric competency #3 "*Document consideration of adverse reactions to medications, including drug-drug and drug-disease interactions, as part of the initial differential diagnosis."* They both describe the initial generation of a differential diagnosis, but the geriatric competency adds pharmacology interactions and adverse reactions to be considered in the differential.

A second finding of this study was that the geriatric competencies align with elements required for minimal KSA competency. This implies that different aspects of geriatric care can (and we argue, should) be taught throughout a resident's training. It also suggests that the geriatric competencies were well developed for the residency level of training and should not be considered "too advanced" or "subspecialty training." While prior research has evaluated separate geriatric-specific curricula,[9–11] our work shows that geriatric competencies can be integrated throughout a curriculum based on the EM Model and KSAs. As of 2021, there were only 25 geriatric fellowship-trained emergency physicians, which is not enough for every residency program.[12] Programs without faculty who have no interest or training in geriatrics could also use external training resources such as the online learning modules at https://geri-em.com/ and at the Geriatric Emergency Department Collaborative (https://gedcollaborative.com/online-learning/).

LIMITATIONS

One limitation of this project was the consensus definitions used. We were unable to find any existing methods to help us

Table 3. The geriatric competencies were mapped onto the 2021 ABEM knowledge, skills, and abilities list.

Geriatric competency	Description	KSA code	Description	Level
G1	Generate a differential diagnosis recognizing that signs and symptoms such as pain and fever may be absent or less prominent in elders with acute coronary syndromes, acute abdomens, or infectious processes.	DX1	Synthesize chief complaint, history, physical examination, and available medical information to develop a differential diagnosis	C
		DX7	Identify obscure, occult, or rare patient conditions	A
		DX8	Construct a list of potential diagnoses based on the chief complaint	D
G2	Generate an age-specific differential diagnosis for elder patients presenting to the ED with general weakness, dizziness, falls, or altered mental status.	DX1	Synthesize chief complaint, history, physical examination, and available medical information to develop a differential diagnosis	C
		DX7	Identify obscure, occult, or rare patient conditions	A
		DX8	Construct a list of potential diagnoses based on the chief complaint	D
G3	Document consideration of adverse reactions to medications, including drug-drug and drug-disease interactions, as part of the initial differential diagnosis.	DX1	Synthesize chief complaint, history, physical examination, and available medical information to develop a differential diagnosis	C
		PT5	Recognize, monitor, and treat adverse effects of pharmacotherapy	B
G6	Demonstrate ability to recognize patterns of trauma (physical/sexual, psychological, neglect/abandonment) that are consistent with elder abuse. Manage the abused patient in accordance with the rules of the state and institution.	LI8	Adhere to processes and procedures to ensure that appropriate agencies are notified in situations that could pose a threat to individual or public health (eg, violence and communicable disease) in accordance with local legal standards	B
		LI10	Adhere to legal and ethical standards to assess and treat patients presenting to the ED	B
		LI11	Advocate for patients vulnerable to violence or abuse in accordance with legal and ethical standards	B
		LI13	Identify patients vulnerable to abuse or and/or neglect	C
G7	Institute appropriate early monitoring and testing with the understanding that elders may present with muted signs and symptoms (eg, absent pain and neurologic changes) and are at risk for occult shock.	DX7	Identify obscure, occult, or rare patient conditions	A
		DS1	Prioritize essential testing	D
		DS2	Determine necessity and urgency of diagnostic studies	E
G8	Assess whether an elder is able to give an accurate history, participate in determining the plan of care, and understand discharge instructions.	CS5	Communicate information to patients and families using verbal, nonverbal, written, and technological skills, and confirm understanding	B
		CS15	Solicit patient participation in medical decision-making by discussing, risks, benefits, and alternatives to care provided	C
		HP2	Prioritize essential components of a history and physical examination given limited (eg, altered mental status) or dynamic (eg, acute coronary syndrome) situations	B
		TC13	Ensure patient has resources and tools to comply with discharge plan, which may include modifying the plan or involving additional resources (ie, PCP, social work, financial aid) to optimize compliance	B

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Table 3. Continued.

Geriatric competency	Description	KSA code	Description	Level
		TC17	Explain clearly and ensure patient understanding of diagnosis, discharge instructions, and the importance of follow-up and compliance with treatments.	B
G9	Assess and document current mental status and any change from baseline in every elder, with special attention to determining whether delirium exists or has been superimposed on dementia.	HP6	Identify relevant historical and physical findings to guide diagnosis and management of a patient's presenting complaint in the context of their baseline condition	B
G10	Emergently evaluate and formulate an age-specific differential diagnosis for elders with new cognitive or behavioral impairment, including self-neglect; initiate a diagnostic workup to determine the etiology; and initiate treatment.	DX1	Synthesize chief complaint, history, physical examination, and available medical information to develop a differential diagnosis	C
		HP2	Prioritize essential components of a history and physical examination given limited (eg, altered mental status) or dynamic (eg, acute coronary syndrome) situations	B
G12	Recommend therapy based on the actual benefit to risk ratio, including but not limited to acute myocardial infarction, stroke, and sepsis, so that age alone does not exclude elders from any therapy.	CS14	Communicate risks, benefits, and alternatives to diagnostic and therapeutic procedures/interventions to patients and/or appropriate surrogates, and obtain consent when indicated	C
		DS4	Review risks, benefits, contraindications, and alternatives to a diagnostic study or procedure	C
		TI8	Assess indications, risks, benefits, and alternatives for the therapeutic intervention.	B
G13	Identify and implement measures that protect elders from developing iatrogenic complications common to the ED including invasive bladder catheterization, spinal immobilization, and central line placement.	DS4	Review risks, benefits, contraindications, and alternatives to a diagnostic study or procedure	C
		PR2	Perform the indicated procedure on an uncooperative patient, patient at the extremes of age (pediatric, geriatric), multiple comorbidities, poorly defined anatomy, hemodynamically unstable, high risk for pain or procedural complications, sedation required, or emergent indication to perform procedure, and recognize the outcome and/or complications resulting from the procedure	B
		PR7	Recognize the indications, contraindications, alternatives, and potential complications for a procedure	D
		TI8	Assess indications, risks, benefits, and alternatives for the therapeutic intervention.	B
G14	Prescribe appropriate drugs and dosages considering the current medication, acute and chronic diagnoses, functional status, and knowledge of age-related physiologic changes (renal function, central nervous system sensitivity).	PT2	Identify relative and absolute contraindications to specific pharmacotherapy	C
		PT5	Recognize, monitor, and treat adverse effects of pharmacotherapy	B
		PT6	Select and prescribe appropriate pharmaceutical agents based on intended e ect and patient allergies	C

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Table 3. Continued.

Geriatric competency	Description	KSA code	Description	Level
		PT9	Select, prescribe, and be aware of adverse effects of appropriate pharmaceutical agents based upon relevant considerations such as intended effect, financial considerations, possible adverse effects, patient preferences, institutional policies, and clinical guidelines.	B
G15	Search for interactions and document reasons for use when prescribing drugs that present high risk either alone or in drug-drug or drug-disease interactions (eg, benzodiazepines, digoxin, insulin, NSAIDs, opioids, and warfarin).	PT2	Identify relative and absolute contraindications to specific pharmacotherapy	C
		PT5	Recognize, monitor, and treat adverse effects of pharmacotherapy	B
		PT9	Select, prescribe, and be aware of adverse effects of appropriate pharmaceutical agents based upon relevant considerations such as intended effect, financial considerations, possible adverse effects, patient preferences, institutional policies, and clinical guidelines.	B
		PT10	Conduct focused medication review and identify agents including nutraceuticals and complementary medicines that may be causing an adverse effect	C
		TI6	Develop protocols to avoid potential complications of interventions	A
		TI8	Assess indications, risks, benefits, and alternatives for the therapeutic intervention.	B
G16	Explain all newly prescribed drugs to elders and caregivers at discharge, assuring that they understand how and why the drug should be taken, the possible side effects, and how and when the drug should be stopped.	CS5	Communicate information to patients and families using verbal, nonverbal, written, and technological skills, and confirm understanding	B
		TC17	Explain clearly and ensure patient understanding of diagnosis, discharge instructions, and the importance of follow-up and compliance with treatments.	B
G17	Document history obtained from skilled nursing or extended care facilities of the acute events necessitating ED transfer including goals of visit, medical history, medications, allergies, cognitive and functional status, advance care plan, and responsible PCP.	CS6	Elicit information from patients, families, and other healthcare members using verbal, nonverbal, written, and technological skills	D
		CS10	Communicate pertinent information to healthcare colleagues in effective and safe transitions of care	C
G18	Provide skilled nursing or extended care facilities and/or PCP with ED visit summary and plan of care, including follow-up when appropriate.	CS10	Communicate pertinent information to healthcare colleagues in effective and safe transitions of care	C
		TC14	Identify patients who will require transfer to a facility that provides a higher level of care and coordinate this transition of care by ensuring communication with the receiving provider, completion of transfer documentation, education of the patient or surrogate the reasons for transfer, consent for transfer, and arrangement of appropriate transportation.	B
		TC16	Use appropriate tools for transitions of care, discharge instructions, prescriptions, follow-up instructions, and any pending diagnostic studies to promote effective care and decrease error	B

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Table 3. Continued.

Geriatric competency	Description	KSA code	Description	Level
G19	With recognition of unique vulnerabilities in elders, assess and document suitability for discharge considering the ED diagnosis, including cognitive function, the ability in ambulatory patients to ambulate safely, availability of appropriate nutrition/social support, and the availability of access to appropriate follow-up therapies.	OB9	Reassess, manage, and prognosticate the course of patients in ED observation status to determine appropriate disposition.	B
		TC13	Ensure patient has resources and tools to comply with discharge plan, which may include modifying the plan or involving additional resources (ie, PCP, social work, financial aid) to optimize compliance	B
		TC18	Correctly determine the appropriate disposition	C
G20	Select and document the rationale for the most appropriate available disposition (home, extended care facility, hospital) with the least risk of the many complications commonly occurring in elders during inpatient hospitalizations.	CS10	Communicate pertinent information to healthcare colleagues in effective and safe transitions of care	C
		OB1	Identify patients appropriate for management in ED observation status	C
		OB9	Reassess, manage, and prognosticate the course of patients in ED observation status to determine appropriate disposition.	B
		TC12	Assign admitted patients to an appropriate level of care	B
		TC14	Identify patients who will require transfer to a facility that provides a higher level of care and coordinate this transition of care by ensuring communication with the receiving clinician, completion of transfer documentation, education of the patient or surrogate the reasons for transfer, consent for transfer, and arrangement of appropriate transportation.	B
		TC18	Correctly determine the appropriate disposition	C
G21	Rapidly establish and document an elder's goals of care for those with a serious or life-threatening condition and manage accordingly.	CS3	Elicit patients' reasons for seeking healthcare and their expectations from the ED visit	D
G22	Assess and provide ED management for pain and key non-pain symptoms based on the patient's goals of care.	ES15	Elicit the patient's goals of care prior to initiating emergency stabilization, including evaluating the validity of advanced directives	B
G25	Develop plans of care that anticipate and monitor for predictable complications in the patient's condition (eg, gastrointestinal bleed causing ischemia).	DS4	Review risks, benefits, contraindications, and alternatives to a diagnostic study or procedure	C
		TI6	Develop protocols to avoid potential complications of interventions	A
G26	Communicate with patients with hearing/sight impairment	CS5	Communicate information to patients and families using verbal, nonverbal, written, and technological skills, and confirm understanding	B
		CS7	Consider the expectations of those who provide or receive care in the ED and use communication methods that minimize the potential for stress, conflict, and miscommunication	B
		CS18	Demonstrate interpersonal and communication skills including adjustment of interactions to account for factors such as culture, gender, age, language, disability, that result in the effective exchange of information and collaboration with patients, families, and all other stakeholders.	B

KSA, knowledge, skills, abilities; *ED*, emergency department; *NSAID*, non-steroidal anti-inflammatory drug; *PCP*, primary care physician.

define curricular overlap. While we were strengthened by having representation from multiple EM residency programs, other education experts may have a different interpretation of the domains and competencies and how they are typically taught. Additionally, the reviewers were not all attendings and not all geriatric-fellowship trained. Despite this, first-round consensus was very high (84-96%), which suggests shared knowledge among the group. The EM residents involved in this project have since started fellowships in medical education and palliative medicine, demonstrating their passion and additional understanding in these areas.

CONCLUSION

The geriatric competencies are included within the EM Model and knowledge, skills, abilities list. The competencies provide more detail for education or board questions. We identified areas of overlap where these subspecialty competencies can be emphasized in EM residency curriculums.

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Emergency Medicine Resident Needs Assessment and Preferences for a High-value Care Curriculum

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Introduction: Consideration of the cost of care and value in healthcare is now a recognized element of physician training. Despite the urgency to educate trainees in high-value care (HVC), educational curricula and evaluation of these training paths remain limited, especially with respect to emergency medicine (EM) residents. We aimed to complete a needs assessment and evaluate curricular preferences for instruction on HVC among EM residents.

Methods: This was a qualitative, exploratory study using content analysis of two focus groups including a total of eight EM residents from a single Midwestern EM residency training program. Participants also completed a survey questionnaire.

Results: There were two themes. Within the overall theme of resident experience with and perception of HVC, we found five sub-themes: 1) understanding of HVC focuses on diagnosis and decision-making; 2) concern about patient costs, including the effects on patients' lives and their ability to engage with recommended outpatient care; 3) conflict between internal beliefs and external expectations, including patients' perceptions of value; 4) approach to HVC changes with increasing clinical experience; and 5) slow-moving, political discussion around HVC. Within the overall theme of desired education and curricular design, we identified four sub-themes: 1) limited prior education on HVC and health economics; 2) motivation to receive training on HVC and health economics; 3) desire for discussion-based format for HVC curriculum; and 4) curriculum targeted to level of training. Respondents indicated greatest acceptability of interactive, discussion-based formats.

Discussion: We conducted a targeted needs assessment for HVC among EM residents. We identified broad interest in the topic and limited self-reported baseline knowledge. Curricular content may benefit from incorporating resident concerns about patient costs and conflict between external expectations and internal beliefs about HVC. Curricular design may benefit from a focus on interactive, discussion-based modalities and tailoring to the learner's level of training. [West J Emerg Med. 2024;25(4.1)51–58.]

INTRODUCTION

A recent shift to focus on "value" in healthcare, often defined as health outcomes achieved per dollar spent, has emerged in response to persistently rising costs over decades.[1] Recent events have highlighted the cost of emergency care in the national spotlight, including federal legislation on surprise billing, insurer denials of claims for emergency department (ED) visits without a final emergent diagnosis, and regulations on payments for air ambulance transports.[2–5] Consistent with these developments, current

Accreditation Council for Graduate Medical Education (ACGME) guidelines state that "residents must demonstrate competence in … incorporating considerations of value, equity, cost awareness, delivery and payment, and risk-benefit analysis in patient and/or population-based care as appropriate."[6]

Despite the current ACGME guidelines and increasing demands for high-value care (HVC), the appropriate educational content and instructional methods have not been clearly established. Moriates and colleagues delineated 21 HVC competencies with beginning, proficient, and expert levels through an iterative process led by a multidisciplinary committee.[7] While rigorous and expert-led, this approach did not include a resident-focused needs assessment, and subsequent needs evaluations have been limited to surveys of internal medicine or pediatrics residents at a single site.[8–10] Similarly, evaluation of proposed internal medicine or pediatrics resident curricula have been limited to single-site pre-/post-surveys, with one study also including post-implementation focus groups.[10–13]

Within emergency medicine (EM), HVC and health economics educational resources are limited, as a 2010 systematic review of cost-effectiveness curricula identified only a single EM curriculum focused on the Ottawa ankle rules. Since that review, two additional contributions that we are aware of include 1) the Emergency Medicine Residents' Association *Residents' Advocacy Handbook* addressing policy-related topics in a textbook-like format and 2) a cost-conscious care curriculum developed by Lin and Laskowski at a single site in New York (personal communication, L. Laskowski).[14,15] There is a paucity of formal, resident-focused needs assessments across specialties, particularly in EM. Our objective was to perform a targeted needs assessment to assess EM residents' needs and interests in HVC and preferences for instructional modality.

Population Health Research Capsule

What do we already know about this issue?
Resident education guidelines now incorporate the topic of value in health care, but few resident-focused needs assessments for this concept are available.

What was the research question?
For high-value care, what are emergency medicine residents' needs, interests, and preferences for instructional modality?

What was the major finding of the study?
Residents self-report low knowledge but are interested in education on high-value care. They prefer discussion-based modalities.

How does this improve population health?
Addressing cost of care through graduate medical education may help address accessibility and affordability of care.

METHODS

Study Design

As part of a curriculum development process, we performed a problem identification and targeted needs assessment for EM residents, corresponding to Kern's six-step approach to curricular development.[16] To achieve our objective, we conducted a qualitative, exploratory study using conventional content analysis. This method allowed us to critically examine the participant responses to identify common categories and elucidate themes. Our secondary objective to determine preferences for instructional modality included a collection of respondents' self-assessments using a survey questionnaire. We obtained institutional review board (IRB) approval for all study procedures.

Setting and Participant Selection

The setting was a single Midwestern United States EM residency program with 56 total residents. Two physician authors were residents at the time of the data collection phase of the project (BHL, SKM). Recruitment of a convenience sample of eight EM residents was performed via email by one of the authors (SKM) to the remaining 54 residents. Nine residents responded. (One resident could not participate due to scheduling constraints.) No participant terminated their participation during the focus group.

Data Collection Procedures

We obtained documentation of informed consent prior to study procedures. A semi-structured interview guide for focus groups was primarily authored by a single author (BHL) and reviewed sequentially by additional authors for revision of content and phrasing (SKM, BP). The interview guide is included as Appendix 1. Focus groups were co-led by two physician authors who were residents at the time (BHL, SKM) following the interview guide. Both focus groups were audio recorded and subsequently transcribed. No field notes were made, nor were transcripts returned to participants for comment. The focus groups occurred during September 2020 in a medical school conference room with no other person present aside from focus group leaders and participants. After the focus group discussion was complete, participants independently completed a survey questionnaire using Likert scale and rank order questions on paper (Appendix 2). Each focus group included four participants with at least one intern (postgraduate year [PGY] 1) in each group. In total,

the first group included one PGY-1, one PGY-2, and two PGY-3 residents; the second focus group included two PGY-1 and two PGY-4 residents. Each focus group lasted between 75–85 minutes. No repeat interviews were completed. Participants received a $15 gift card for compensation, consistent with IRB guidelines.

Data Analysis

The transcripts were reviewed and conventional content analysis with line-by-line coding was completed by two independent coders (BHL, SKM). Using an open coding technique, important statements were identified (generally termed "the first cut").[17] Codes were developed in vivo and did not reference previous literature. (They are depicted in a coding tree in Appendix 3.) Significant redundancy in codes was identified, which was felt to be consistent with thematic saturation.[18] The analysis team came together with a third reviewer (BP) to categorize, refine, and cluster important statements, and subsequent themes and domains emerged. We used the consolidated criteria for reporting qualitative research (COREQ) as reporting guidelines (Appendix 5).[19] Descriptive statistics were performed in Microsoft Excel for questionnaire data, and we used Word (Microsoft, Redmond, WA) for transcripts and coding documentation. The use of independent coders and a team of three to categorize and develop themes enhanced credibility, and investigator triangulation aided confirmability of the results.[18]

Reflexivity Statement

Reflexivity of the research team included recognition that the focus group leaders and coders were known to the participants and identified their respective specific interests in HVC/health economics (BHL) and medical education (SKM) to the participants as part of the introduction. The focus group leaders identified as male (BHL) and female (SKM). BHL and SKM were residents at the time of the study. BP provided training to BHL and SKM regarding techniques in semi-structured, focus group facilitation; BHL had limited prior experience with focus group facilitation. A methodological limitation is that the same residents comprised the focus groups and completed survey questionnaires; survey questionnaire results may have been influenced by the preceding focus group discussion, although all questionnaires were completed independently by all participants without additional discussion.

RESULTS

A total of eight residents participated. With respect to the importance of education about HVC topics, residents endorsed the relevance of HVC topics to the resident physician (7/8, [88%]) and the importance of a HVC curriculum (8/8, [100%]) (Appendix 4, Figure 2). We identified two overarching themes: 1) experience with and perception of HVC; and 2) desired education and curricular design. For each overarching theme, component sub-themes summarized clusters of resident comments for which we include representative comments and (if identified) participant recommendations.

Overarching Theme 1: Experience with and Perception of High-value Care

Sub-theme 1: Understanding of high-value care focuses on diagnosis and decision-making.

Residents most frequently associated HVC with the activities that facilitate diagnosis and decision-making in the ED. For example, when asked whether they had a general definition for or had heard of the phrase "high-value care," one resident highlighted using the ED evaluation to "*appropriately figure out what is going on with this patient and decide where to send them*" (Resident #1, PGY-1). In this understanding, residents believe care activities are high value if they allow the clinician to make a diagnosis or disposition. Less commonly, other residents mentioned aspects of HVC such as resource use, stewardship (citing a specific example of a cost-savings initiative related to the use of combat gauze [Resident #7, PGY-4]), and the concept of cost-benefit analysis: "*clinical decision rules that … reduce unnecessary head CTs, not only from a radiation perspective, but also from a cost-savings perspective*" (Resident #8, PGY-4).

Sub-theme 2: Concern about patient costs.

In the focus group discussion, residents voiced uncertainty due to varying patient insurance reimbursement of care provided in the ED and concerns surrounding high patient costs, in large part due to a self-identified lack of knowledge. Because of this knowledge gap, residents felt inadequately prepared to have conversations surrounding cost and insurance coverage with patients. One of the participants recalled a patient encounter in which the resident felt uninformed to address the patient's reaction after the resident disclosed the presence of a new mass concerning for cancer:

> *How much is this going to cost me? How am I going to pay for this?' [and] I didn't know the answer. … It'd be nice if I actually had some data … like you're uninsured, it's ok, because it's going to be like this for the financial plan, if you're insured, this is what happens. I have no clue." (Resident #5, PGY-3)*

Other residents stated that they were unaware of the costs of commonly ordered diagnostics and therapeutics in the ED. They described being concerned and unaware of the financial and social ramifications of care activities on patients' lives outside of the hospital, and they particularly worried about the impact on patients' ability to engage with

recommended outpatient care: "*It's how much the patient gets charged that would actually matter from a social determinants of health perspective*" (Resident #2, PGY-1). Residents particularly cited feeling challenged by shared decision-making discussions when patients had financial concerns.

Sub-theme 3: Conflict between internal beliefs and external expectations.

Residents noted that there may be a conflict between a physician's personal beliefs and the external expectations and pressures they face. Some external expectations, such as those from systems-level "hurdles" placed in the electronic health record-ordering interface, are explicitly identifiable for residents: "*I try to order [intravenous acetaminophen] all the time. IT takes you through, you have to go through all these questions because they're trying to keep me from ordering [it]. . . . I know they're trying to keep me from ordering it, but I'm going to keep on ordering it*" (Resident #8, PGY-4). Other external expectations are perceived to be implicit within the medical community: *"Even though we talk about in an academic setting, or in a boardroom, it's OK to have a miss from a statistical perspective, I think culturally that's not acceptable. . . . It's just not playing out in the real world, in my opinion, accepting that there is a miss rate*" (Resident #4, PGY-2).

Residents particularly highlighted that patients are a source of external expectations and recognized that patients may view cost, quality, and value of care differently from the emergency physician. This difference in perception may lead to a disconnect in expectations: *"Value can really be in the eyes of the beholder . . . makes me think about what I think might be the best thing for the patient may not be at all the same as what the patient values"* (Resident #6, PGY-3). Moreover, the conflict between internal beliefs and external expectations can overshadow attempts to prioritize HVC. A context cited for this conflict were ED visits of patients who commonly frequent the ED. For these patients, the lack of community resources for patients can be frustrating and render a learner feeling helpless or unable to provide holistic patient care. For these patients, trainees noted feeling a disconnect between the care they felt expected to provide and the care they desired to provide.

Sub theme 4: Approach to high-value care changes with increasing clinical experience.

Residents shared anecdotes that demonstrate how the definition of and approach to optimize HVC changes with increasing clinical experience. One junior resident highlighted "wanting to know" as motivation for ordering testing: *"I'm as curious as [the patients] are, to be honest; so I want to know that this patient is perhaps a presentation of [a specific diagnosis]" (Resident #4, PGY-2)*. Similarly, as one non-intern resident reflected:

> *"And honestly, that's something that comes with time – like if you told me as an intern I could order a million-dollar test and get the answer that I need, I would 100% do it because it's easy, I'll be right, and I can help the patient. But as you practice medicine you realize . . . if you have a million-dollar test to answer if it's GERD . . . it's not going to change your management . . . As I'm progressing through residency I get more and more curious, and I'm more willing to accept information about [HVC]" (Resident #5, PGY-3)*

Sub-theme 5: Slow-moving, political discussion around high-value care in medicine.

In general, residents describe themselves as loosely aware of the political, academic, financial, and clinical implications of national discussions on HVC topics for future emergency physicians. For example, "*How you determine value? I remember back when Obama was still around and in office, I remember that was a big discussion, you know—what is real value and who determines that? That's sort of a black box" (Resident #8, PGY-4)*. Another resident reflected,

> *"There is always chatter out there in the . . . political and insurance world. And I'm not sure I know where like the landmark policy or . . . guiding foundation is for that conversation. So, certainly, outside there is a feeling that there is always this chatter happening*" (Resident #4, PGY-2).

When asked about proposed physician reimbursement models currently undergoing federal regulatory review, most residents did not know what those future policies entailed. In addition, many residents reported not being well versed in current reimbursement models, although non-intern residents reported more interest in current reimbursement information.

Overarching Theme 2: Desired Education and Curricular Design

Sub-theme 1: Limited medical education on health economics and high-value care.

When asked about their prior training in health economics and HVC topics, all residents noted minimal to no prior exposure during their medical training. In the survey questionnaire, all participants (8/8 [100%]) either strongly disagreed or disagreed with the statement "I feel confident that I know the cost of the care that I provide to patients in the emergency department" (Appendix 4). Much of the prior exposure described by residents was comprised of brief and infrequent didactic-based discussions that were described

as leading to limited information retention and limited application to clinical practice.

Beyond this, they voiced the belief that there were few opportunities for knowledge acquisition due to lack of available resources, particularly with respect to prices and costs of healthcare activities. Residents were not familiar with hospital-based or nationally based resources that could assist with day-to-day clinical healthcare questions such as patient cost: "*I think hospitals are mandated to have some sort of list, master list, of how much things costs, but it's also super hard to find … I have no idea where I would find that information*" (Resident #7, PGY-4).

Sub-theme 2: Motivated to receive training on high-value care and health economics.

The EM residents identified themselves as frontline healthcare workers. In their role, they interact directly with the community and patients with diverse backgrounds, particularly individuals facing financial barriers to accessing care. Because of this unique position in the medical field, residents believe that financial and insurance pressures may underlie patients' utilization of the ED and that clinicians should therefore understand these factors. One resident reflected

> "*I think when you … look … at healthcare as a gestalt, people are seeing primary care [clinicians] less and less and relying on the ED more for primary care. And assuming that that trend continues … I think as an emergency physician it is important to know those things [healthcare economics topics] because of that reason, just the utilization of the ED in general*" (Resident #1, PGY-1).

One resident also noted that the lack of health economics knowledge can put emergency physicians at a disadvantage in influencing and leading systems-based practice:

> *"I think not understanding [HVC and health economics topics] takes away a lot of our power to be a leader and makes us more pawns carrying out someone else's vision of how medicine should be practiced" (Resident #6, PGY-3).*

Residents recognized the importance of and need for further training on HVC topics to understand the impact that their decision-making has on patients and the healthcare system.

Sub-theme 3: Desire for discussion-based format for high-value care curriculum.

Residents were asked what the optimal format for HVC curriculum would be for residency-level learners, and the majority were in support of a discussion-based format.

> *"I like the idea of the case-based, small-group discussion. Especially when you have attendings there, and you have varied learner levels, and I kind of like that because you get varied sorts of inputs and that's interesting. And I just feel like this sort of stuff, these sorts of topics, are best, for me, explored verbally" (Resident #8, PGY-4).*

One resident noted that because this is not common knowledge among emergency clinicians, involving a content expert would be critical to a successful curriculum:

> *"Another part of incorporating this, is who is the content expert…. [HVC care is] a topic that … a typical academic [emergency] physician would [not] know about. It almost needs to be a collaboration… [someone] with health economic interest and knowledge and someone with an education background, too, to figure out how to incorporate this" (Resident #7, PGY-4).*

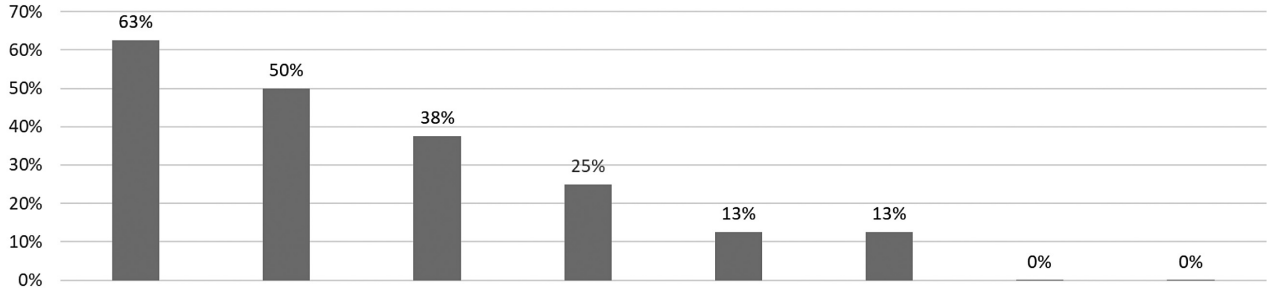
Consistent with this qualitative theme, the highest percentage of residents ranked modalities with the opportunity for interactive small-group discussion highly, whether as online apps or in person, on the survey questionnaire (Figure 1).

Sub-theme 4: Curriculum targeted to their level of training.

While most of the residents recognized the need for a formal HVC curriculum during medical training, there was variation in when they thought this curriculum should be introduced at the residency-training level. The PGY-1 and PGY-2 residents voiced desire to focus on clinical knowledge acquisition in lieu of health economics topics:

> *"As an intern, I'd rather be more towards the clinical aspect of things right now … I don't think I've developed that skill enough to want to sacrifice one of those journal clubs for health economics. I think as a later resident, I'd be on board …" (Resident #1, PGY-1).*
>
> *"My initial thought was that I would want something clinically relevant because I feel like [I am] earlier in training and just trying to build that foundation …" (Resident #4, PGY-2).*

A non-intern resident noted *"I feel like as I'm progressing through residency, I get more and more curious and I'm more willing to accept information about that stuff [HVC]"* (Resident #5, PGY-3). In reply to an intern indicating the topic of "[relative value units] *and physician-associated income … wouldn't appeal or apply to me right now when I would just forget it*" (Resident #3, PGY1), Resident #7 (a PGY-4) reflected that non-intern residents would be interested due to personal decision-making: *"I would say the PGY-3s because some of the PGYs would start signing contracts in the summer"*



Instructional modality	Online interactive app small groups	In-person interactive small groups	Online modules (self-paced asynchronous)	In-person large group didactic instruction	Secondary literature reading	Primary literature reading	Case-based in-person small group discussion	Optional resident interest group
Mean ranking (lower better)	2.75	3.125	4.625	4.375	5	6.375	4.875	5.125

Figure 1. Percentage of respondents ranking each instructional modality among top two choices and mean ranking within eight modality options ($n = 8$).

An interesting perspective raised by one of the non-intern residents was the potential to negatively influence junior learners' practice patterns if topics of HVC were introduced too early in medical training:

> *"I wonder from an education mission side, could you influence early trainees' . . . practice patterns because of knowledge of this. And I don't want that to happen . . . you need to see where you fall in that spectrum to develop your practice pattern. And I wonder if you find out that a test costs this amount of money, maybe you won't get to fully explore that spectrum and develop your own point on that spectrum" (Resident #7, PGY-4).*

Lastly, a couple of residents voiced concern about the integration of a novel curriculum in an EM training program given that EM's scope of practice already addresses many adjacent disciplines:

> *"We're all kind of in agreement that a baseline level of understanding you should have . . . but as far as about data and literature . . . I'd kind of reserve that for people that have an interest in it, similar to how we do with other things, like sports medicine" (Resident #3, PGY-1).*
>
> *"You have so many things to learn. Not only clinically, but also our non-clinical curriculum . . . is pretty impressive, so it's tough [to] add a whole other curriculum" (Resident #8, PGY-4).*

DISCUSSION

Residents recognized the importance of learning HVC principles for application in both patient care and to inform systems-based practice; however, they felt inadequately trained on the topic. Our needs assessment identified two main themes to inform EM-specific curricula addressing HVC topics: resident experience with and perception of HVC, and desired education and curricular design.

Consistent with studies in other disciplines and settings, the residents reported limited confidence in their knowledge of basic HVC principles, and the financial impacts of cost of care for individual patients and the healthcare system as a whole.[9,10,13] Sub-themes 1 (understanding of HVC focuses on diagnosis and decision-making) and 2 (resident concerns about patient costs) in this study were consistent with themes from focus groups completed with general pediatrics residents at two centers of "how an intervention changes management" and "thinking about the cost as a harm."[10]

Residents stated that early on in their training, HVC knowledge gaps are related to patient costs, patient insurance reimbursement, cost-benefit analysis, and resource stewardship. Later, self-identified knowledge gaps emerging as non-intern learners were primarily related to physician reimbursement. A review of the literature, including prior work within pediatrics and internal medicine, suggested no prior evidence of resident knowledge or interest varying by experience level; if validated in additional settings, such variations with learner experience would provide valuable guidance in the design of educational curricula.

The resident participants stated their lack of formal training in and basic knowledge of HVC was a barrier to providing high-value emergency care. They also reported limited awareness of national health policy yet were less interested in a detailed understanding of these topics. This finding suggests that a specialized elective may be better suited to education regarding health policy topics that do not directly tie into day-to-day emergency care, as in the example described by Greysen and colleagues.[21] Finally, the participants also indicated the need for more education on system-wide reimbursement and HVC policies. To meet this

need, prior national-level survey data from internal medicine residents and program directors suggests that institutional support for both HVC faculty development and provision of physician cost-of-care performance data are associated with an increase in resident reports of education on HVC.[22]

Unanticipated aspects of HVC that were viewed as learner obstacles included dynamic conflicts between internal learner beliefs and external expectations and the variability in value perception between patients and clinicians. These issues may complicate residents' perception of and implementation of HVC in the clinical setting; addressing these issues within HVC education is critical to avoid unintentional creation of anxiety, or even moral distress, in the training environment. In an intern-targeted curriculum in internal medicine, Hom and colleagues also discussed resident-perceived barriers surrounding intra-team, interdisciplinary, and patient and family dynamics and how they complicate understanding and implementation of HVC principles at an early learner stage.[14] Thus, future curricula will need to focus both on foundational knowledge dissemination and techniques on how to approach the above barriers.

An additional unexpected barrier raised by residents in the focus group was the concern that the existing EM training curriculum does not have the capacity to incorporate HVC; and, therefore, HVC training may not fit as a core element. While not addressed in these focus groups, a future direction for work in this area should include evaluation of how residents would weigh HVC training compared to other curricular elements and whether there would be opportunity to make potential "tradeoffs."

In terms of curricular design and format, themes emerged to optimize not only knowledge acquisition and understanding, but also timing during the residency training program. The resident participants were in support of an expert-led, discussion-based curriculum to learn the principles of HVC, consistent with the experiences of Hom and colleagues.[13] These findings also coincide with those of Stammen et al in their systematic review, concluding that reflective practice through feedback and group discussions incentivize physicians to think critically about medical decisions.[19]The residents also suggested that HVC topics should be targeted more toward non-intern residents who have mastered proficiency in basic clinical knowledge and skills and would be able to apply these new principles with more purpose than their junior counterparts, although some earlier knowledge base to supplement formative experiential growth throughout residency may be beneficial. They did voice concern that the introduction of HVC too early in residency could jeopardize early learners' practice pattern development.

LIMITATIONS

There are several limitations to consider with regard to our study. First, this study reflects a sample of residents from a single-center, large academic hospital and may not be applicable to all academic- and community-based training programs. Because it was a single-center study, we could not distinguish how three-year programs or four-year programs with different approaches to resident progression or "seniority" would differ from the findings identified here. Second, only a small subset of program residents participated in either focus group, leading to the possibility of selection bias with regard to the participants who volunteered to discuss their thoughts on HVC. These residents may have had a particular interest in medical education or HVC that may not be applicable to all EM residents across the country. The small subset of participating residents also likely limited the number of available perspectives to be collected and inform thematic saturation.

Third, the study included a mix of junior and senior residents. While the study allowed for a rich spectrum of experience to inform previous exposure to HVC principles, it may not have been as impactful as evaluating the perspectives of the most experienced residents in a program who had nearly completed the entire program curriculum and could identify areas for nuanced improvement. Fourth, while the use of focus groups (rather than one-on-one interviews) allowed emergent discussion between participants, the presence of peers may have led some participants to avoid making statements due to fear of being perceived as controversial. Fifth, due to transitions in roles, member checking could not be performed. While our study adds a critically necessary needs assessment to the current body of literature, further and more rigorous studies that include a larger number of residency programs and participating residents are needed to verify these findings to accurately inform future EM curricula.

CONCLUSION

Our targeted needs assessment indicates that residents currently face gaps in knowledge of high-value care topics pertaining to the medical care that they provide and may benefit from additional training during residency. Residents interviewed in this study identified several perceived barriers to understanding HVC, but they consistently expressed interest in a formal curriculum to address these challenges. We found a preference for interactive, small-group discussion-based formats with content adjusted by level of clinical training.

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