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Original Article

Palliative Care Education in Emergency Medicine Residency Training: A Survey of Program Directors, Associate Program Directors, and Assistant Program Directors

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Abstract

Context. Emergency medicine (EM) residents perceive palliative care (PC) skills as important and want training, yet there is a general lack of formal PC training in EM residency programs. A clearer definition of the PC educational needs of EM trainees is a research priority.

Objectives. To assess PC competency education in EM residency programs.

Methods. This was a mixed-mode survey of residency program directors, associate program directors, and assistant program directors at accredited EM residency programs, evaluating four educational domains: 1) importance of specific competencies for senior EM residents, 2) senior resident skills in PC competencies, 3) effectiveness of educational methods, and 4) barriers to training.

Results. Response rate was 50% from more than 100 residency programs. Most respondents (64%) identified PC competencies as important for residents to learn, and 59% reported that they teach 7 PC skills in their residency program. In Domains 1 and 2, crucial conversations, management of pain, and management of the imminently dying had the highest scores for importance and residents' skill. In Domain 3, bedside teaching, mentoring from hospice and palliative medicine faculty, and case-based simulation were the most effective educational methods. In Domain 4, lack of PC expertise among faculty and lack of interest by faculty and residents were the greatest barriers. There were differences between competency importance and senior resident skill level for management of the dying child, withdrawal/withholding of nonbeneficial interventions, and ethical/legal issues.

Conclusion. There are specific barriers and opportunities for PC competency training and gaps in resident skill level. Specifically, there are discrepancies in competency importance and residency skill in the management of the dying child, nonbeneficial interventions, and ethical and legal issues that could be a focus for educational interventions in PC competency training in EM residencies. *J Pain Symptom Manage* 2016;51:898–906. © 2016 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

Key Words

Medical education, residency training, palliative care, emergency medicine

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Introduction

The emergency department (ED) is an appropriate setting for palliative care (PC) and initiating PC consults.^{1–12} Patients with chronic and terminal illnesses present to the ED with complex psychosocial and medical needs, often near the end of life.^{1,2,5,13} According to one study, more than 75% of older adults visit the ED in the last six months of life.¹⁴ Increasingly, physicians are deferring end-of-life conversations, requiring emergency physicians to rely on many of the same skills as hospice and palliative medicine (HPM) specialists.^{1,2,15} When initiated in the ED, PC can enhance patient-centered care through symptom management, by eliciting patient and family preferences, through referral to appropriate community resources, and by reducing inpatient lengths of stay.^{2,6,7,16–18}

Importance

There are multiple challenges to PC in the ED, including a perceived lack of time and knowledge among emergency physicians and a paucity of HPM subspecialists.^{8,17,19–24} Formal training in PC has been identified as one solution to the barriers of delivering PC in the ED.^{4,25} Although few emergency physicians will pursue fellowship training in HPM, PC competencies are required for board certification in EM, and educating emergency physicians to have primary skills in PC is a priority.^{26–28}

A formal curriculum exists to educate emergency physicians in these competencies. The Education in Palliative and End-of-life Care for Emergency Medicine (EPEC™-EM) is a National Institutes of Health-funded project created in 2007 to teach the essential clinical competencies in PC to professionals who work in the ED.²⁹ At least one EM residency program has adapted EPEC™-EM for resident instruction.³⁰ EM residents perceive PC skills as important and want training, yet there is a general lack of formal PC training in EM residency programs.^{31,32} A clearer definition of the PC educational needs of EM trainees is a research priority.³³

Study Goals

The goals of this study were to assess, through a survey of program directors (PDs), associate program directors (APDs), and assistant program directors (aPDs), PC instruction in EM residency programs and to identify barriers and opportunities for integrating PC into EM training.

Methods

Survey Design

The study is a mixed-mode and cross-sectional anonymous survey. No previously validated surveys

on this topic exist. A study of pulmonary and critical care fellowship directors provided the concept of surveying PDs via e-mail to assess trainee competence in PC.³⁴ To establish face and content validity, the survey was piloted among 10 core faculty members in three EM programs in distinct geographical regions who are involved in resident education and familiar with curriculum development and delivery. To maintain the integrity of the final survey to be distributed among PDs/APDs/aPDs, none of the faculty who participated in the pilot survey was surveyed for the final study. As a result of feedback from the pilot survey, the survey was revised. Revisions included putting the questions about the importance of PC training and prevalence of teaching at the beginning of the survey, placing the demographic questions near the end of the survey, and clarifying the wording of various questions. The initial and revised surveys were reviewed by a panel of scientists on a doctoral thesis committee, including experts in curriculum and survey design.

PC competencies were included from the literature of EM PC² and EPEC™-EM.²⁹ Survey questions included demographic information for subjects and institutional characteristics. A conceptual framework with four domains was created. Two of these domains, the importance of individual PC competencies for the senior EM resident and the skill of senior EM residents in individual PC competencies, were assessed and compared. The remaining two domains, barriers to PC competency education and the effectiveness of educational methods, were assessed.

In addition to the four domains, two questions were included to address the goals of the study:

- How important is it to include hospice and PC concepts in EM residency training curricula? and
- do you currently teach PC competencies in your residency?

There was no power calculation for this is a descriptive study with the entire population of interest invited to participate.

Selection of Participants

The study population included PDs, APDs, and aPDs from all U.S. EM residency programs accredited by the American Osteopathic Association (AOA) and the Accreditation Committee on Graduate Medical Education (ACGME). When the study began, there were 45 AOA and 155 ACGME EM residencies, with five dual AOA-ACGME accredited.

The ACGME³⁵ and AOA³⁶ Web sites provided a list of accredited EM residencies. The names and contact information for program leadership were obtained by searching the Web sites of individual residency

programs and by reviewing residency information maintained on the Web sites of the following professional societies and organizations: the Society for Academic Emergency Medicine,³⁷ the Emergency Medicine Residents' Association,³⁸ the American College of Emergency Physicians,³⁹ the American Academy of Emergency Medicine,⁴⁰ and the American College of Osteopathic Emergency Physicians.⁴¹

When data were missing or incomplete, program coordinators were contacted to verify PD, APD, and aPD, resulting in a list of 402 potential study subjects.

Survey Administration

Web-Based Distribution. The web-based survey (see Appendix, available at jpsmjournal.com) used commercially available software (CVENT, Inc., McLean, VA).⁴² E-mail addresses of the potential study participants were uploaded into a secure database on the password-protected CVENT site, and a survey link was e-mailed to subjects with a web link and introductory paragraph about the study.

Mail Distribution. After approximately seven weeks, a mailed survey identical to the web-based version was distributed to the study population in an attempt to improve response rate. A minimum of three copies of the survey was sent to each program (PD, APD, and aPD). Additional copies were sent to programs that had additional APDs or aPDs. A single postage-paid return envelope was included in the mailing. A \$25 gift card was sent to every program with this packet regardless of whether a completed survey was returned. Envelopes were addressed to program coordinators to distribute to PDs, APDs, and aPDs. A trained research assistant coded and entered the data into the CVENT database.

Meeting Distribution. Near the conclusion of the mailed survey collection, a final attempt was made to increase participation among osteopathic program faculty. During the meeting of the American College of Osteopathic Emergency Physicians, a staff member who was unaffiliated with the study placed the surveys in the back of the meeting room and asked PDs, APDs, and aPDs to voluntarily complete the survey and place the completed anonymous survey in an envelope also in the back of the meeting room. This final method of distribution was used because, in general, osteopathic EM programs are in smaller community hospitals without university affiliations, making it more difficult to contact the staff and faculty in these programs. The completed surveys ($n = 6$) were then entered into the database by research staff in the same manner as the mailed survey. Because of the small number of

responses from the meeting distribution, these six surveys were included with the mailed surveys for analysis.

Human Subjects Protection

As an anonymous survey describing educational curriculum, the study met exempt criteria when reviewed by the institutional review boards. Participation in the study was voluntary. Completion of the survey represented subjects' consent for participation.

Data Analysis

Descriptive analyses were used to characterize study subject characteristics. Descriptive analyses for the four domains were performed, with Likert scores assigned means and SDs. When multiple responses were received from an institution, respondents were analyzed by position (e.g., PD, APD, aPD) and not compared as a group with groups of respondents from other institutions. The anonymous survey design did not allow for calculation of agreement of responses among respondents from the same institution. Bivariate analyses were performed for the importance of PC training in EM residency. Difference of means (*t*-test) was performed for PD and institutional characteristics as well as mean scores on survey domains. Several variables described in the bivariate analysis had a large number of missing observations and therefore were not included in the regression model. The variables included in the regression model were gender, PD type, familiarity with EPECTM-EM, and the mean rating on barriers to PC education.

Bivariate regression analyses were performed for the following question: "Do you currently teach PC competencies in the EM program?" After bivariate analysis, multivariate analysis was performed with the following variables: gender, PD familiarity with EPEMTM-EM, institutional characteristics of HPM consult availability in the ED and HPM rotation availability for EM residents, and barriers to PC education. There were too few qualitative comments to perform analysis. $P < 0.05$ was statistically significant. Statistical analyses were performed using SAS software (SAS Institute, Inc., Cary, NC).

Results

Characteristics of Study Subjects

Demographic Variables. Of the 402 individuals identified as PDs, APDs, or aPDs, 201 returned completed surveys (summary demographics, Table 1). Responses were received from more than 100 residency programs. Almost half (48%) of the responses were from Michigan, New York, Pennsylvania, California, Ohio, and Texas, the six states where half of all EM residencies are located. Most respondents (64%)

Table 1
Selected Demographic Characteristics

Variable	ALL (%)	PD (%)	APD (%)	aPD (%)
Gender				
Male	66.2	72.3	59.6	60.5
Female	30.8	25.7	35.1	37.2
Missing	3.0	2.0	5.3	2.3
Program accreditation				
MD	46.3	42.6	52.6	46.5
DO	14.9	17.8	8.8	16.3
MD + DO	4.5	3.0	7.0	4.6
Missing	34.3	36.6	31.6	32.6
Hospital location				
Urban	50.2	46.5	52.6	55.8
Suburban	13.9	15.8	14.0	9.3
Rural	2.5	2.0	0.0	7.0
Other	1.5	1.0	3.5	0.0
Missing	31.8	34.6	29.8	27.9
U.S. region				
Northeast	3.0	2.0	3.5	4.6
Mid-atlantic	14.4	18.8	12.3	7.0
East North Central	20.4	16.8	15.8	34.9
West North Central	4.4	5.9	3.5	2.3
South Atlantic	8.5	5.0	15.8	7.0
East South Central	3.0	2.0	3.5	4.6
West South Central	5.5	6.0	7.0	2.3
Mountain	1.5	2.0	1.8	0
Pacific	5.5	5.0	5.3	7.0
Missing	33.8	36.6	31.6	30.2
Familiar with EPEC-EM				
Yes	23.9	23.7	19.3	30.2
No	75.6	75.2	80.7	69.8
Missing	0.5	0.1	0.0	0.0

ALL = all respondents; PD = program director; APD = associate program director; aPD = assistant program director; MD = allopathic emergency medicine residency; DO = osteopathic emergency medicine residency; MD + DO = dual accredited emergency medicine residency; EPEC-EM = Education in Palliative and End-of-life Care for Emergency Medicine. Percentages might not equal 100% because of rounding.

identified PC competencies as important (Likert score greater than 7), and 59% teach PC skills in their residency program. Among the respondents, 101 (50.2%) were PDs, 57 (28.4%) were APDs, and 43 (21.4%) were aPDs. On average, PDs had been in that position for an average of 7.04 years (SD 6.89), APDs for an average of 4.67 years (SD 3.92), and aPDs for an average of 3.07 years (SD 2.34). aPDs were slightly more likely to report familiarity with EPECTM-EM.

Two-thirds (133 of 201) of respondents reported having access to HPM consultants. Respondents in the East North Central, Mid-Atlantic, and South Atlantic regions reported having an institution-sponsored HPM fellowship in their institution more often than respondents in other regions ($P < 0.02$; missing $n = 68$).

Comparisons of Paper and Web-Based Responses

Of the 201 surveys, 80 (40%) were completed using the web-based survey and 121 (60%) were completed on paper. There were no significant differences noted between the web-based and paper respondents in demographic characteristics or in responses in the four domains.

Responses to Four Domains

A full list of mean scores for the four domains is presented in Tables 2–5. In the domain of the importance of individual PC competencies for senior EM residents, difficult communication/breaking bad news/death disclosure (i.e., crucial conversations) (mean 4.88, SD .40), management of pain (mean 4.77, SD .53), and management of the imminently dying (mean 4.74, SD .53) had the highest mean scores. Respondents identified crucial conversations (mean 4.28, SD .66), management of pain (mean 4.17, SD .72), and management of the imminently dying (mean 3.91, SD .88) as the three skills in which their residents were most proficient. Bedside teaching (mean 4.53, SD .81), mentoring from HPM faculty (mean 4.11, SD .97), and case-based simulation were identified as the three most effective educational methods for delivering PC content. Lack of PC experience or expertise among faculty (mean 3.57, SD 1.21), lack of faculty interest in PC (mean 3.42, SD 1.20), and lack of resident interest in PC (mean 3.04, SD 1.20) had the highest mean scores in the barriers domain.

The largest differences in mean Likert scores between the importance of PC competency and the senior resident skill level domains (Table 6) were for the following variables: management of the dying child (mean difference 1.47), withdrawal and withholding of nonbeneficial interventions (0.90), ethical and legal issues (0.84), and management of the imminently dying (0.83).

Factors Associated With Perceptions of PC Importance

In the bivariate analysis, the availability of HPM consultants in the ED and the availability of an HPM rotation for EM residents had significant association with a perceived importance of PC training in EM residencies. aPDs perceived PC in EM training to be more important compared with PDs (0.77 on the five-point Likert scale, SE 0.32, and $P < 0.018$).

Table 2
Effectiveness of Educational Training Methods for PC Competencies

Educational Method	Mean Likert Score (SD)
Bedside teaching	4.53 (.81)
Case-based simulation	4.37 (.85)
Mentoring from HPM faculty	4.11 (.97)
Standardized patient	3.96 (.94)
Didactics	3.82 (.86)
Rotation in HPM	3.61 (1.22)
On-line/self-directed	3.33 (1.07)
Reading list	2.72 (1.02)

PC = palliative care; HPM = hospice and palliative medicine.

1 = very ineffective, 2 = somewhat ineffective, 3 = neutral, 4 = somewhat effective, and 5 = very effective.

Survey question: In your opinion, what is or would be the effectiveness of the following methods for providing education in hospice and PC competencies to the residents in your program?

Table 3

Importance of PC Competency for Senior-Level Resident	
Competency	Mean Likert Score (SD)
Difficult communication/breaking bad news/death disclosure	4.88 (.40)
Management of pain and nonpain symptoms	4.77 (.53)
Management of the imminently dying	4.74 (.53)
Management of the dying child	4.73 (.60)
Ethical and legal issues	4.64 (.59)
Withdrawal and withholding of nonbeneficial interventions	4.59 (.63)
Assessment of illness trajectory	4.39 (.74)
Basic formulation of prognosis	4.36 (.70)
Spiritual and cultural competency	4.32 (.69)
Family presence during resuscitation	4.28 (.82)
Management of hospice and PC system referrals	4.15 (.87)
Advance care planning	3.96 (.94)

PC = palliative care.

1 = very unimportant, 2 = somewhat unimportant, 3 = neutral, 4 = somewhat important, and 5 = very important.

Survey question: How important is each hospice and PC competency for the senior level (post-graduate year 3 or post-graduate year 4) emergency medicine resident?

Compared with those who were not familiar with EPECTM-EM, those respondents who were familiar had higher perceptions of the importance of PC (0.95 on the five-point Likert scale, SE 0.31, and $P < 0.003$).

Factors Associated With Teaching PC in EM Residencies

Bivariate analysis (χ^2) showed the following factors to be associated with teaching PC in an EM residency program: familiarity with EPECTM-EM (59.3% teach vs. 40.7% do not teach, $P < 0.015$); HPM consult availability in ED (59.5% vs. 40.5%, $P < 0.0001$); and the availability of an HPM rotation for EM residents (59.3% vs. 40.7%, $P < 0.0001$).

Table 4

Senior Resident Skill Level in PC Competencies

Skill	Mean Likert Score (SD)
Difficult communication/breaking bad news/death disclosure	4.28 (.66)
Management of pain and nonpain symptoms	4.17 (.72)
Management of the imminently dying	3.91 (.88)
Family presence during resuscitation	3.90 (.88)
Basic formulation of prognosis	3.86 (.86)
Assessment of illness trajectory	3.81 (.80)
Ethical and legal issues	3.80 (.72)
Withdrawal and withholding of nonbeneficial interventions	3.69 (.79)
Spiritual and cultural competency	3.57 (.81)
Management of hospice and PC system referrals	3.38 (.99)
Advance care planning	3.32 (.93)
Management of the dying child	3.26 (1.02)

PC = palliative care.

1 = very unskilled, 2 = somewhat unskilled, 3 = neutral, 4 = somewhat skilled, and 5 = very skilled.

Survey question: Indicate the level of skill that your senior emergency medicine residents (post-graduate year 3 or post-graduate year 4) have in the following hospice and PC competencies.

In the senior resident skill domain, there was a statistically significant difference between those respondents who teach PC and those who do not teach PC (mean score, teach 3.97, 95% CI 3.88, 4.06 vs. mean score, do not teach 3.67, 95% CI 3.57, 3.78). Three specific resident skills were significantly different between the two groups: management of the imminently dying (mean score, teach 4.83, 95% CI 4.74, 4.91 vs. mean score, do not teach 4.61, 95% CI 4.47, 4.75); crucial conversations (mean score, teach 4.37, 95% CI 4.26, 4.49 vs. mean score, do not teach 4.15, 95% CI 3.99, 4.32); and management of pain (mean score, teach 4.28, 95% CI 4.14, 4.41 vs. mean score, do not teach 4.02, 95% CI 3.87, 4.18).

In the barriers domain, two specific barriers were significant: the lack of PC experience/expertise among faculty (mean score, teach 3.29, 95% CI 3.06, 3.52 vs. mean score, do not teach 3.97, 95% CI 3.75, 4.20) and a lack of faculty interest in PC (mean score, teach 3.27, 95% CI 3.04, 3.50 vs. mean score, do not teach 3.67, 95% CI 3.44, 3.90).

In the effectiveness of educational methods domain, only mentoring from HPM faculty showed a statistically significant difference between respondents who teach PC and those who do not teach PC (mean score, teach 4.23, 95% CI 4.06, 4.40 vs. mean score, do not teach 3.92, 95% CI 3.69, 4.16).

In the multivariate regression model, there was an association between the availability of HPM consultants in the ED and teaching PC competencies in the residency (mean score 3.082, 95% CI 1.519, 6.250). A moderate association was found between the availability of an HPM rotation for EM residents and PC (mean score 2.069, 95% CI 1.089, 3.970).

Discussion

Hospice and PC is an area of growing importance in EM, making it necessary for emergency physicians to be skilled in its practice. Previously, there have been surveys of residents and faculty that have attempted to evaluate PC education in EM residency training, but these studies were limited in scope.^{30,31} Our study is the first to describe the current understanding of PC competencies training in EM residencies from a national sample of residency program educators. With 64% of respondents identifying hospice and palliative competencies as important and 59% teaching these competencies in their EM residencies, there is an opportunity for further research about how to overcome educational barriers and gaps to prepare emergency physician trainees to be skilled in this important area of EM practice.

In other specialties, educational initiatives have focused on identifying the best method (e.g., case

Table 5
Barriers to Training EM Residents in PC Competency

Barrier	Mean Likert Score (SD)
Lack of HPM experience or expertise among faculty	3.57 (1.21)
Lack of faculty interest in HPM	3.42 (1.20)
Lack of resident interest in HPM	3.04 (1.20)
Lack of GME, policies, or other institutional support for HPM education	2.94 (1.27)
Poor or lack of collaboration with HPM consult service	2.88 (1.36)
Other institutional factors	2.83 (1.12)
Other faculty factors	2.66 (1.07)
Religious, ethical, or cultural concerns among residents	2.20 (1.08)
Religious, ethical, or cultural concerns among faculty	2.10 (1.12)

EM = emergency medicine; PC = palliative care; HPM = hospice and palliative medicine; GME = Graduate Medical Education.

1 = not a barrier at all, 2 = marginal barrier, 3 = neutral, 4 = moderate barrier, and 5 = significant barrier.

Survey question: How significant are the following barriers to education in hospice and PC competencies in your residency program?

simulations, didactics, etc.) for presenting PC competencies to trainees. For example, a case-based PC workshop for general surgery residents improved knowledge and perception of PC.⁴³ Among internal medicine residents, a classroom intervention did not improve PC knowledge and attitudes,⁴⁴ but a web-based learning program combined with bedside clinical competency evaluation by attending clinical faculty was effective.⁴⁵ Among pediatric residents, a discussion-based seminar series increased confidence in providing care for seriously ill and dying children.⁴⁶ Based on these data from other specialties, and our results, case-based simulation cases and bedside teaching are likely to be the best educational methods for improving EM residents' knowledge and skills in PC competencies. Furthermore, encouraging EM residents to complete an elective rotation in HPM might provide the mentoring from an HPM specialist that

was noted by respondents to be another effective method for PC competency education.

Our study identifies both those educational methods that EM educators find most effective and potential areas for targeted educational interventions. The distribution of Likert responses among specific variables in the four domains suggests that certain barriers and educational training methods should take priority with regard to PC competency training in EM residencies. For example, within the barriers domain, a lack of faculty experience and interest were greater barriers than religious, ethical, or cultural concerns among residents or faculty. Specific educational interventions to address this barrier could be to partner with other departments with faculty expertise or to integrate the training into existing curriculum, such as intensive care unit rotations. Additionally, the use of EPEC™-EM in EM training has been shown to be a valuable resource for improving EM resident knowledge of PC concepts³⁰ and might be helpful for EM faculty education as well. This is especially important given that many EM faculty in this survey seem to be unaware of EPEC™-EM and, therefore, might not be in a position to evaluate PC competency in EM residents.

Additionally, our results show discrepancies between the perceived importance of certain PC competencies and reported resident skill levels in these same competencies. For example, the management of the dying child was considered to be a very important competency for senior EM residents but emerged last as a perceived skill. This finding is an opportunity to develop and dedicate curriculum resources toward those specific competencies that are important but for which residents were not seen as highly skilled. For PDs, APDs, and aPDs, these are specific areas where limited curricular time can be focused to equip residents with an important competency. Our findings also suggest the need for additional research and

Table 6
Discrepancies Between Perceived Competency Importance and Reported Senior Resident Skill Level

Competency	Mean Difference in Likert Score	Competency Importance	Resident Skill Level
		Mean Likert Score (SD)	
Management of the dying child	1.47	4.73 (.60)	3.26 (1.02)
Withdrawal and withholding of nonbeneficial interventions	0.90	4.59 (.63)	3.69 (.79)
Ethical and legal issues	0.84	4.64 (.59)	3.80 (.72)
Management of the imminently dying	0.83	4.74 (.53)	3.91 (.88)
Management of hospice and PC system referrals	0.77	4.15 (.87)	3.38 (.99)
Spiritual and cultural competency	0.75	4.32 (.69)	3.57 (.81)
Advance care planning	0.64	3.96 (.94)	3.32 (.93)
Difficult communication/breaking bad news/death disclosure	0.60	4.88 (.40)	4.28 (.66)
Management of pain and nonpain symptoms	0.60	4.77 (.53)	4.17 (.72)
Assessment of illness trajectory	0.58	4.39 (.74)	3.81 (.80)
Basic formulation of prognosis	0.50	4.36 (.70)	3.86 (.86)
Family presence during resuscitation	0.38	4.28 (.82)	3.90 (.88)

PC = palliative care.

consensus development of priority competencies for EM trainees similar to those recently proposed for medical students and internal medicine and family medicine residents by a panel of PC experts.⁴⁷

Finally, our results suggest that aPDs were more likely to respond that teaching PC competencies was important compared with APDs and PDs. This finding could signal future directions in PC education in EM because many aPDs become APDs and then PDs. If aPDs view PC training as important, there might be a movement toward more PC training in EM residencies in the future. Conversely, the differences between aPDs and PDs/APDs could reflect the unique perspectives of each of these positions on residency curriculum development and delivery. PDs have unique program leadership and management perspectives that might impact their responses compared with aPDs. If the latter is the case, it is possible that the responses of aPDs would change when they become APDs and PDs. A future research question to better address this specific difference would be to longitudinally follow aPDs to monitor their responses to the same survey questions as their academic position changes.

Limitations

Survey research has limitations previously described in the literature. Selection bias is a potential limitation in this study; however, including the entire known population of EM residency PDs, APDs, and aPDs minimizes this bias. There is the possibility that EM programs had changes in PD, APD, or aPD leadership during data collection that were not reflected in real time as the study progressed.

Response bias is a potential limitation. The response rate of 50% is satisfactory when the sample response is representative of the population as a whole, as in this study.⁴⁸ The study design did not allow for comparisons between responders and nonresponders. However, the mixed-mode design can serve as a proxy comparison between late (i.e., paper) and early (i.e., web based) respondents as there was a short lag period between the distributions of these two modes. Respondents might have been overrepresented by faculty with more interest in PC or from programs with multiple respondents (e.g., PD, several aPDs). The survey was anonymous to maximize respondents' willingness to answer, which limits statistical comparisons of respondents from the same institution. Additionally, the low response among osteopathic programs might hint at differences among these programs with regard to PC education.

There is the possibility that subjects could have completed the survey more than once with the mixed-mode study design. In an attempt to minimize

this possibility, a check box was included with the mailed survey requesting that respondents check the box if the survey was completed online. Those surveys that were returned with this box checked were excluded from analysis. The gift card was sent to all programs regardless of whether the survey was completed, so that should not have impacted participation.

Finally, missing data are a potential limitation. Nonresponse for demographic questions might have been a result, in part, of the placement of these questions at the end of the survey, when respondents are most fatigued. It is also possible that respondents chose not to answer demographic questions to protect their identities. The response rates to the four domains were robust and, therefore, the goals of the study can be realized even without complete demographic responses.

Conclusions

Emergency physicians need to possess a unique set of PC skills, including the knowledge of pain and symptom management at the end of life, the ability to deliver bad news, and the compassion to help patients and family members trying to cope with emergent and difficult treatment decisions. Residency training has lasting impacts on how physicians practice throughout their careers.⁴⁹ Training in PC competencies during residency will equip emergency physicians with the skills to use PC principles in their postresidency practice, including in community settings where fewer PC resources and HPM specialists are available. This study identifies specific barriers and opportunities for PC competency training in EM while providing a foundation for future research on specific PC competencies and gaps in resident skill level. Specifically, there are discrepancies in competency importance and residency skill in the management of the dying child, nonbeneficial interventions, and ethical and legal issues that could be a focus for educational interventions in PC training in EM residencies. An important next step and area for research is the development of a consensus and evidence-based approach to PC competencies for EM trainees.

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Supplementary data

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