

The role of emergency medicine for postgraduate year one undifferentiated physician: a qualitative analysis of trainees' perspective

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Abstract

Background

PGY1 program was initiated in 2003 for undifferentiated physicians in Taiwan, the program aimed to improve the general competency gap exposed during the SARS epidemic breakout in physicians. Many published studies discussed the effectiveness of the program. We were interested in the learning impacts gained from the physicians' perspectives during EM rotation in the PGY1 program, and little was known regarding this subject.

Methods

This retrospective study used grounded theory data analysis methods. 201 PGY1 physicians rotated in the emergency department from August 2014 to July 2017 answered three open-ended post-rotation survey questions and resulted in a dataset of 603 comments. A three-member team for code development reviewed all comments and established the code themes with the consensus of the team members. A four-member coding team coded applicable comments accordingly.

Results

We coded 563 (96%) comments and sorted 32 themes essential to characterize the clinical experiences into two categories. Twenty-six codes were relevant to professional development; 6 were related to the emotional issue. In the professional development category, *patient care* (33%) was the most frequently coded domains in the sub-level of six core competencies, followed by *system-based practice* (25%) and *interpersonal and communication skills* (19%). *Senses of growth and improvement* were the most frequently coded theme in the emotional issue category, followed by *pressure at the workplace* and *on-the-spot-feedback*. The top 3 lessons learned by physicians' perception were *decision-making, team and patient communication, and prioritize tasks*.

Conclusions

EM rotation had a productive role in professional development for undifferentiated physicians before receiving specialty discipline training. Gaining experiences on clinical judgment and communication were the strengths of the EM PGY1 program. This model of analysis might be used as a novel way of assessment on the achievement of learning objectives from the trainee's perspective. However, a prospective standardized study protocol is needed for a further affirmative conclusion.

Background

The SARS epidemic outbreak in 2003 exposed a deficiency in the general competency among physicians. In response to this issue, postgraduate-year one (PGY1) general competency training, also known as the PGY1 program, was initiated in 2003 nationwide in Taiwan for all physicians before receiving specialty discipline training. The program's duration was only three months long at the beginning, expanded into six months in 2006, and extended to a one-year term in 2011. A newly revised two-year program initiated in 2019 as the first class of physicians graduated from a reformed system of six-year term medical schools, aimed to have more integrity of school education and general medicine training for all physicians.

This one-year PGY1 program consisted of clinical rotations in internal medicine, general surgery, pediatrics, obstetrics and gynecology, emergency medicine (EM), community medicine, and elective rotations of other disciplines. Several studies have published and discussed the achievement of objectives goals assessed through various methods. [1,2,3] Further research on the effectiveness of specific rotations like community medicine in the program was discussed in the literature. [4,5] Experience in EM is considered a critical part of medical education, [6] EM rotation provides excellent primary care training opportunities by encountering a significant breadth of the patient population and managing a diversity of clinical presentation. Although PGY1 physicians have EM clerkships, the clerkship experiences vary in rotation block time, total hour worked, shift length, and use of teaching modalities. Not all PGY1 trainees had the same level of exposure to the primary care experience. [7,8] The PGY1 program functions as an enhancement tool filling the insufficiency gap of the primary care training in clerkship. One study showed that PGY1 physicians' performance scores significantly increased in all six core competencies after training in the emergency department and ward. [9]

Narrative comments are evaluation tools commonly used to assess trainees' clinical performance. [10] The popular qualitative analytical tool, like Workplace-based narrative assessment (WBNA), represents the faculty's viewpoint. However, the subjective experiences of trainee physicians were rarely discussed in the literature. One previous research has analyzed the comments of medical students on EM rotation that showed positive impacts on learning and clearing information for improving the training course. [11] Nevertheless, we know little about PGY1 physicians' thoughts and feelings about this compulsory rotation.

Reflection is an essential capacity in core ACGME competencies, [12] reflective practices as a teaching modality have been reported in a few specialty training. [13,14] In our department, we have been hosting a review session focused on trainees' self-reflection and feedback since the program's initiation. The information received during the meeting helped improve the program and get a more in-depth understanding of trainee feelings.

Objective

The study was an extension of our regular review session, to explore PGY1 physicians' perception through a scientific reflection-oriented approach, analyzed respondents' self-assessed impacts from their

EM rotation experience. The analyzed data could be used as supporting evidence to justify the role and highlight the areas of strength of EM rotation in the PGY1 program.

EM rotation in PGY1 course

EM rotation in the PGY1 course implemented in an ED staffed with board-certified EM attending physicians on-site 24 hours for patients' medical service and trainees' supervision. The compulsory EM rotation for PGY1 was a one-month block time, consisted of three crucial sections: an orientation, work shifts, and a review session. The full-day clinical-driven orientation incorporated an extensive range of learning modalities, including interactive didactics covering topics of the learning objectives, avoiding common EM pitfalls, administrative and communication skills, simulation workshops on handover, the use of the electronic medical system, and a group of simulated case-based discussion. The practical training included 14 twelve-hour shifts in clinical service, equally distributed between day and overnight shifts. While working on clinical shift, all trainee physicians were assigned an attending physician for on-the-spot feedback and supervision to ensure adequate quality of the trainees' procedural skills and medical service. The patient care duties for PGY1 physicians were 20 patients on average per shift. The trainees' self-reflection and feedback are three-hour sessions that the PGY1 program director gathered with all trainees, commented on the problems encountered during the training, listened to their self-reflections, and received verbal feedback from trainees.

Method

Subjects for this retrospective analysis were PGY1 physicians who completed EM rotation from August 2014 to July 2017 in an urban hospital accredited as a medical-center-level institution with an annual census of more than 130,000 emergency department (ED) patient visits. We wanted to focus on trainees' thoughts specifically on the role of the EM rotation within the overall experience context, so the survey asked trainees to respond to three open-ended questions. The open-ended questions allowed an in-depth exploration of the trainees' perception of the rotation, and the purpose of multiple inquiries was not to constrain physicians in their thinking about what they considered to be appropriate EM rotation objectives from a single perspective or question. We included these open-ended questions on the existing post-rotation questionnaire survey that was part of the EM course requirement. Our analysis process involved both quantitative and qualitative research methods. The study design received approval from the Investigational Review Board of the hospital. The theme and retrospective nature of the study did not require a formal consent process. We completely de-identified all data before analysis.

Data

201 PGY1 physicians completed the survey within five days after the end of the rotation. We implemented prompt reply instruction within five days to take advantage of the recent EM rotation's fresh and explicit memory. The responding rate was 100%; the trainees answered all three questions and generated a dataset of 603 comments.

Analysis process

We used grounded theory data analysis methods [15] to gather the ideas and emotions that emerged from the data and were significant enough to deserve their codes, specifically statements expressed their valuable impacts on learning from the clinical experience. Three team members formed a code development group and studied the responses; they first suggested code for inclusion independently, reviewed the code application with each other, and resolved disagreements. The final code scheme consisted of two categories, professional development, and the emotional issue. We further sorted professional development codes into one of six core competency domains by American College for Graduate Medical Education (ACGME). Each response was reviewed and coded based on the agreed keywords by the coding group. The content of each response was parsed into one or multiple codes. The coding group had four team members working independently. The code was validated and cross reviewed with each other, reaching consensus on coding. We analyzed the data using Google Sheets software.

Data from question one, "What were the most valuable lessons you learned from EM rotation?" was also used to assess the importance rank-order of the codes identified, as the question used explicitly priority phrase "the most valuable". Importance rank-order was established based on the number of PGY1 physicians who expressed priority for each theme.

Result

The result is presented in two sections reflecting different conceptual levels of overview and analysis. The first section provides a quantitative overview of all coded themes in two categories. The second section focused on the analysis of responses to three individual questions.

Quantitative overview of all coded themes in two categories

We received a total of six hundred three comments from PGY1 physicians. Of these, we coded 563 (96%) comments, and 22 (4%) did not match any code themes. We sorted a total of thirty-two themes essential to characterize the clinical experiences during EM rotation into two categories. Twenty-six were clinically relevant to professional development, with an overall code frequency distribution of 74%. (Figure 1) We further classified the coded themes based on the six ACGME competency domains in the professional development category. *Patient care* was the domain with the most frequently coded competency themes (33%), followed by *system-based practice* (25%), and *interpersonal and communication skills* (19%). (Figure 2) Among the *patient care* domain, ACGME competency most salient to PGY1, *decision-making* was the most frequently coded theme (39%).

Of the emotional issue category, we identified six codes with the coding frequency distribution of 26%. The three most common codes were *senses of growth and improvement* (27%), followed by *pressure at the workplace* (26%), and *on-the-spot-feedback* (19%). (Figure 3) We noted that two of the most common

codes occupied the fourth and fifth positions in overall frequency counts. (Figure 4) This finding indicated that a hard and stressful EM rotation could be a rewarding learning experience.

Quantitative and qualitative analysis of comments on three survey questions

The analysis revealed thirty-one codes from the responses to the first question, "What were the most valuable lessons you learned from EM rotation?", twenty-six of them were relevant to professional development. Five belonged to the emotional issue category. Three most valuable lessons learned were *decision-making* (n=70), *team and patient communication* (n=59), and *prioritize tasks* (n=48). No themes from the emotional issue category entered the top ten list. (Table 1)

Table 1. Ten most valuable lessons perceived by PGY1 physicians.

Theme	number of Trainees (n=201)	Importance rank-order*	Overall coding frequency rank-order
Decision-making	70	1	1
Team & patient communication	59	2	3
Prioritize tasks	48	3	7
Time management	47	4	2
Differential diagnosis	40	5	5
Critical thinking	34	6	6
Effective communication	32	7	9
Patient evaluation	29	8	8
Handover	17	9	4
Disposition	14	10	13

*Importance rank-order was established based on the number of PGY1 physicians who expressed priority for each theme in question one.

Furthermore, three out of the ten most important lessons, their coding frequency ranks, were in the same order as the priority list. PGY1 physicians perceived *decision-making* as the most valuable theme, consistent with the most frequently coded theme in the *patient care* domain. Of coding frequency distribution, the themes in the professional development category were dominant, with 94%.

Of the dataset from responses to the second question, "What were the differences between your anticipated and actual learning experiences in EM rotation?", fifty PGY1 physicians (25%) reported no

difference existed for the anticipated and actual rotation experiences, eleven (6%) reported exceeding expectations with valuable experiences, and nine (5%) reported experiences less useful. Although only seventy trainees (36%) answered directly to the question with comparative description, most of them seized the opportunity to elaborate on other themes in the responses. There were 23 themes recognized in the professional development category, and the coding frequency distribution in this category was 59%, less dominant compared to the result of the first question, and no themes from this category entered the top three most frequently coded list. We identified six themes in the emotional issue category, and the three most frequently coded themes were *patient volume pressure* (n=41), followed by *pressure at the workplace* (n=30), and *senses of growth and improvement* (n=30).

Complex ER environment contributes to various forms of pressure like patient visit volume pressure, workplace pressure, or peer pressure. We have frequently noticed the concern of pressure relevant to the rotation from the trainees during our orientation, and some PGY1 physicians were anxious about this issue on their first day. Nevertheless, the tone of that pressure switched from a negative emotion to a motivation later in the review session. It is worth noting that the number of PGY1 physicians felt less useful regarding their clinical experiences did not match closely to the total frequency of the pressure themes in the emotional issue category. This result may suggest that PGY1 physicians perceived pressure as acceptable and could manage it as a driving force to work and learn during rotation.

There were thirty themes identified to the third question "Any afterthoughts regarding your EM rotation experience?". The three most common themes were *senses of growth and improvement* (n=58), followed by *pressure at the workplace* (n=48), and two themes tied in third place, *on-the-spot-feedback* (n=37), and *handover* (n=37). The emotional issue category dominated the most frequently coded list but had less overall frequency distribution of 41%. The data from the response of this question may suggest a productive and positive role of EM rotation for undifferentiated physicians in the PGY1 program and the valuable lessons identified by the trainees were the evidence supported the role.

Discussion

EM rotation experience has been discussed extensively in the literature, and EM rotation has a crucial role in medical education, specifically in medical students. [7] Our analysis has demonstrated some unique facts about the EM rotation on the PGY1 physician level.

The most valuable lesson perceived by trainees is a crucial skill for physicians to master, as it dictates the course direction in a clinical service framework. Many studies discussed the methods or process of medical *decision-making* [6, 16, 17], but research regarding where or what rotation is a more suitable training place or discipline is hard to find in the literature. One qualitative study revealed medical students commenting EM rotation as an outstanding venue to develop *decision-making* skills. [11] In practice, medical *decision-making* is often complicated, dynamic, and under time pressure, especially in ED. [16] Studies pointed out the multiple contextual factors like possible acute life-threatening conditions, limited time, case experience, and scanty information available all made *decision-making* in ED even more

difficult and challenge. [16, 17] We believe that our PGY1 training program had the following contextual factors contributed to *decision-making* as the most valuable lesson learned during EM rotation. First, exposure to a large case volume was one crucial element; a study of the *decision-making* process revealed that individual physicians' case experience could have a medium effect on the confidence rating. [16] In our program, the PGY1 physicians took care of an average of twenty patients during a shift. Although our result indicated that some trainees felt the pressure from this patient volume, the large case volume exposed provided the opportunity to increase *decision-making* confidence gained from previous similar case experiences.

Another contextual factor was *on-the-spot feedback*, the third high-frequency emotional issue theme perceived by PGY1 physicians. When trainees encountered difficulty in *decision-making*, the most direct and efficient solution was to consult senior staff or faculties from the team. PGY1 is part of a care team and but works mostly independently in other disciplines rotation, guidance and support are available; nevertheless, help is minutes away to obtain in reality. Unlike in the EM clinical setting, the EM attending physician is available 24-hour, PGY 1 physicians can consult and request guidance without time or distance barriers. For inexperienced PGY1 physicians to perform clinically at an individual's best level, adequate supervision is needed, but timely delivery of supervision is also essential in a fast-path, high tension work environment like ER.

When we further sorted the ten most valuable lessons perceived into groups based on the similarity of theme nature. Groups of clinical judgment and the domain of interpersonal communication were identified. Three themes of *decision-making*, *critical thinking*, and *disposition* were relevant to how doctors think and the realm of clinical judgment. Furthermore, the other three themes, including *team and patient communication*, *effective communication*, and *handover*, were all relevant to the *interpersonal and communication skills* domain of ACGME core competencies. We think these two domains were the strengths of our EM rotation, as trainees felt significant impacts on these two skills of clinical judgment and communication during training.

ER is a high-pressure environment. Nevertheless, we do not discuss frequently and openly how ER doctors face pressure at the workplace; studies on such a subject are rarely found in the literature. When pressure is manageable by physicians, it lets physicians stay alert, motivated, able to work and learn. When pressure becomes excessive and unmanageable, it leads to stress that can elicit health issues and interfere with the clinical performance of physicians—the results of this study highlight that pressure is an inevitable and vital issue during ED rotation. Interestingly, our analysis may suggest that the existing pressure did not lead to the worst scenario of stress but instead might play toward a positive role for PGY1 physicians as an external stimulus of learning. We believe that the *on-the-spot-feedback* theme has a significant role in pressure relief; a previous study found that colleagues are an essential resource for stress relief. [18] Based on our data, we hypothesize that faculty supervision with *on-the-spot-feedback* may be an effective technique to reduce stress for inexperienced physicians in the ER.

The compulsory post-rotation survey has been a course requirement for PGY1 trainees in our department. We kept the routine in consideration of the internal consistency and selection bias; the implementation aimed to exclude a low response rate as a limitation in this study. However, a recent study revealed a conflicting result that compulsory evaluation might raise the concern over the reliability. [19] We felt that different medical schools attended by PGY1 physicians and compulsory surveys contributed to a fair representation of the database in our research.

Limitations

Some aspects of this research may limit the generalization of the results. First, our PGY1 physicians graduated from different medical schools; their previous EM exposure in clerkship may influence the perception of this rotation. Those who had impressive experience on some professional development elements from EM clerkship may constrain the expression of the crucial impact on particular themes. Second, this study was done at a single site. Although nationwide PGY1 EM training is guided by goals and objectives specified by PGY1 EM rotation task force of Taiwan Joint Commission, the official accreditation agency for healthcare education programs in Taiwan, the actual execution of PGY1 program curriculum may be influenced by various local factors, such as the availability of teaching modalities, type, quality of instant guidance provided to the PGY1 trainees, and case diversity. [20] Third, it was involved in a single discipline. Generalizing our results to other PGY1 discipline or training sites should be done with caution. Another limitation of this research was the lack of an in-depth analysis of coded themes. Our study focused on what outstanding impact resulted from EM rotation. The results did not mean to infer the absolute positive or negative influence of each theme to PGY1 physicians.

Conclusion

The study indicated that EM rotation had a productive role in professional development for undifferentiated physicians. Gaining experiences on clinical judgment and communication were the strengths of the EM PGY1 program, and PGY1 physicians perceived decision-making as the most valuable lesson learned from EM rotation. Trainees benefit the most on general competency training from the EM rotation may not be the same as program directors anticipated or the trainees expected. This model of analysis might be a novel way of assessing the achievement of learning objectives from the trainee's perspective. However, we need a prospective standardized study protocol for a further affirmative conclusion.

Declarations

Ethics approval and consent to participate

The study design received approval from the Investigational Review Board of MacKay Memorial Hospital.

Consent for publication

The theme and retrospective nature of the study did not require a formal consent process.

Availability of data and materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Competing interests

All authors declare no competing interests.

Funding

None to report.

Authors' contributions

All authors participated in the analysis and interpretation of the data in the study. WT was a significant contributor to the study concept, study design, and writing of the manuscript. All authors read and approved the final manuscript.

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Figures

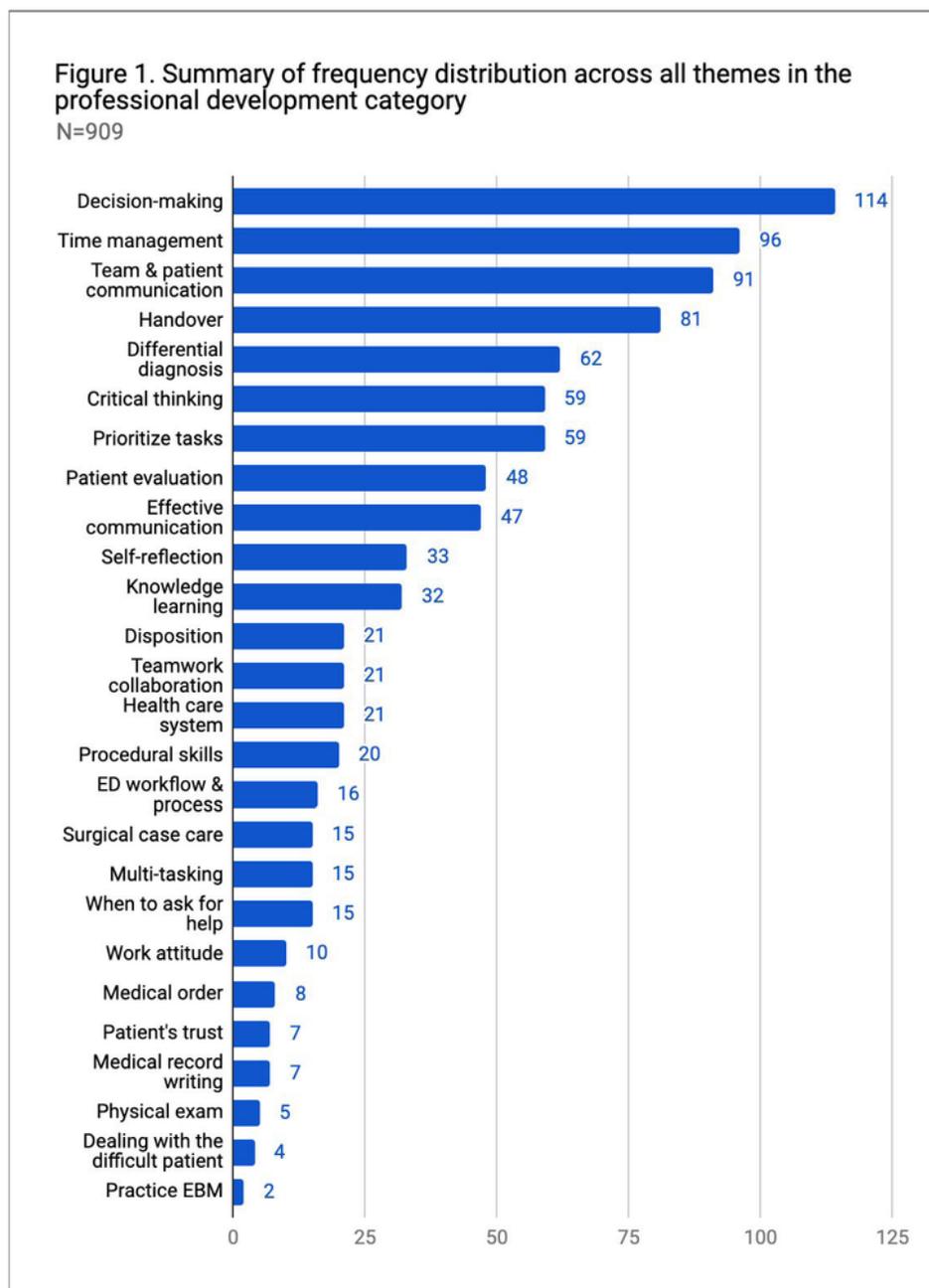


Figure 1

Summary of frequency distribution across all themes in the professional development category

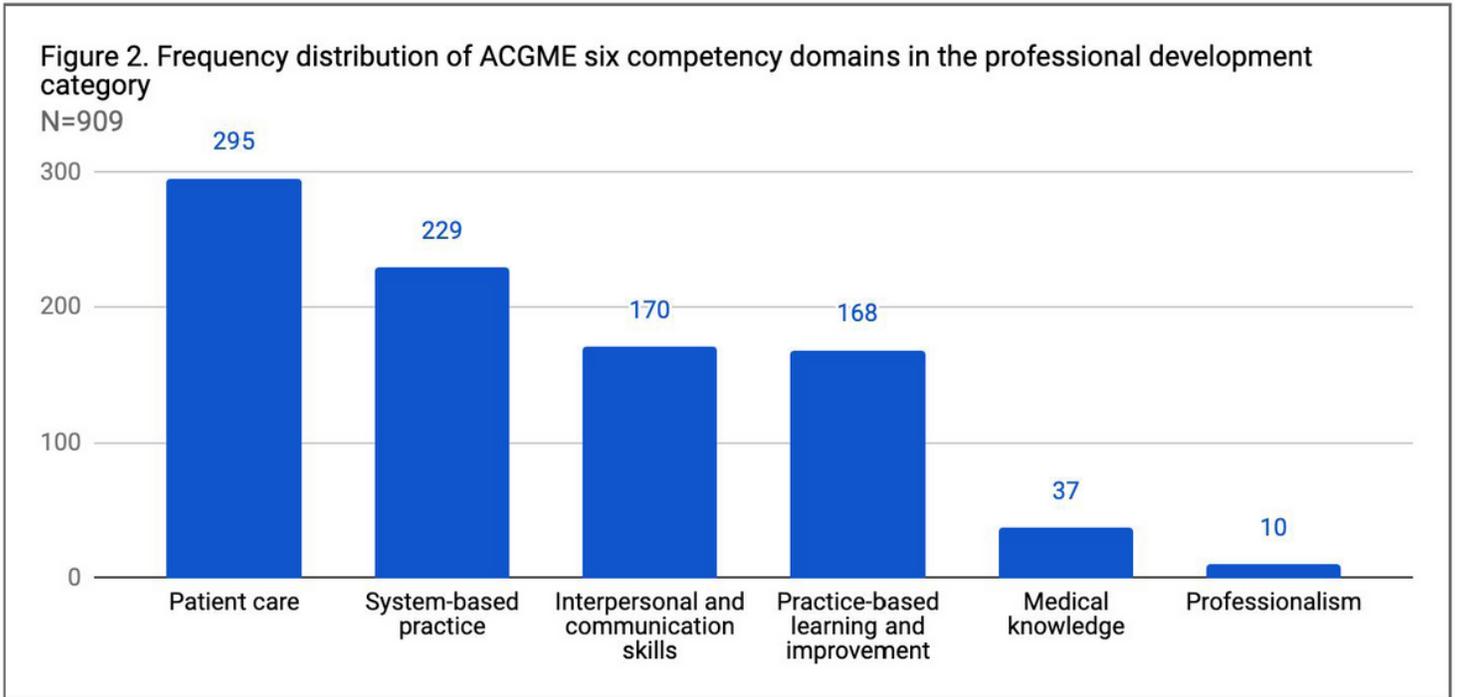


Figure 2

Frequency distribution of ACGME six competency domains in the professional development category

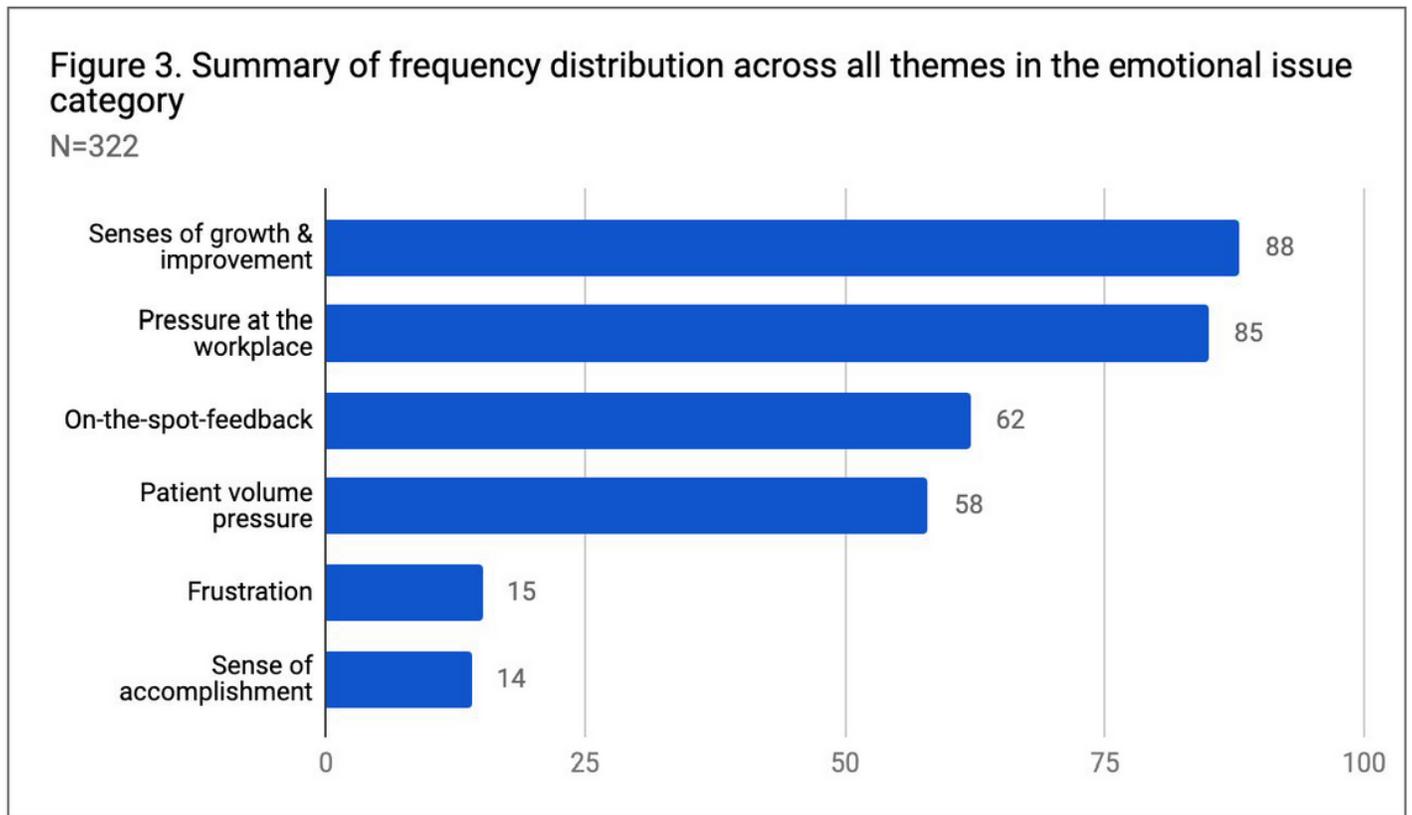


Figure 3

Summary of frequency distribution across all themes in the emotional issue category

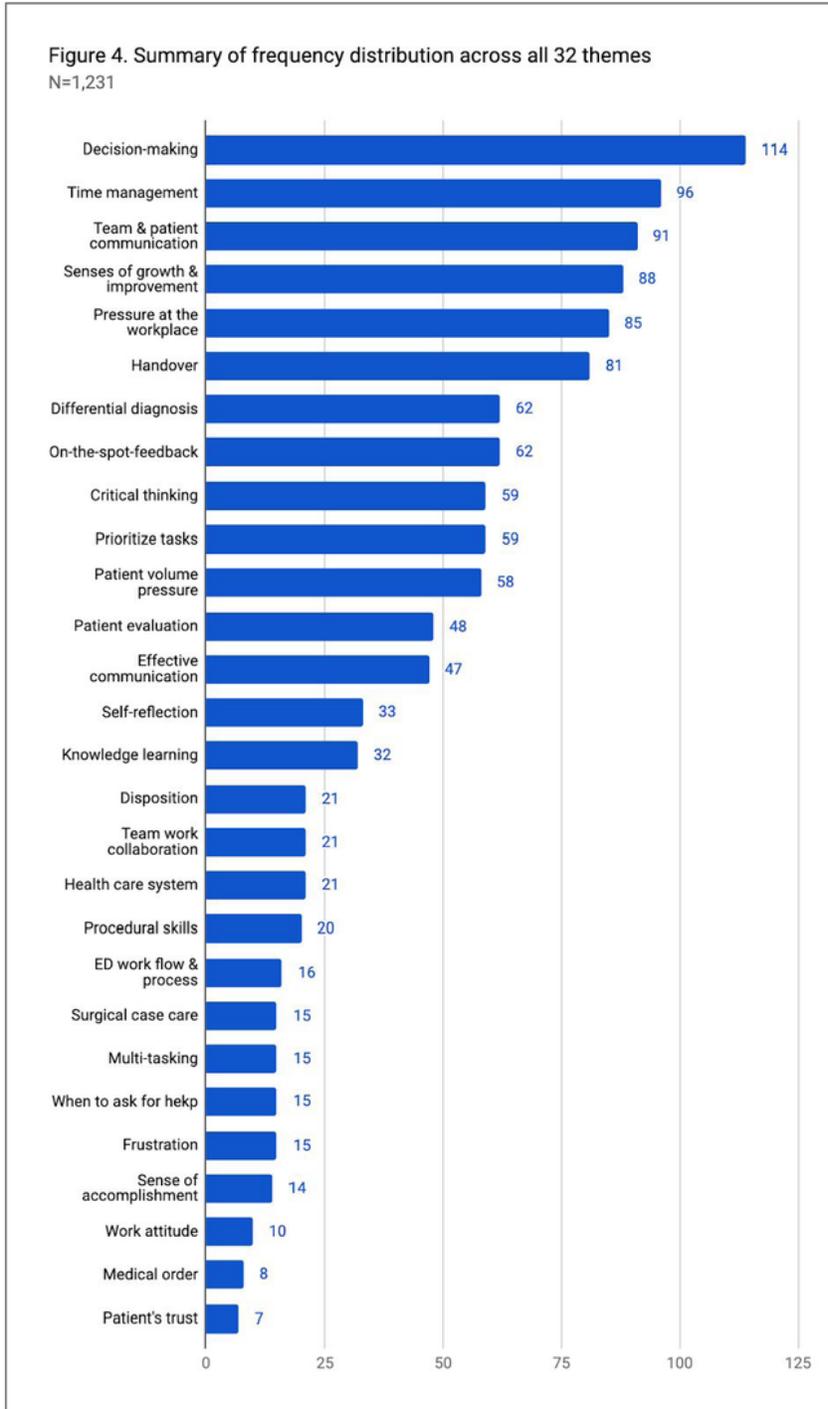


Figure 4

Summary of frequency distribution across all 32 themes