MedJEM

Original Research

Bridging the Gap Towards Developing Emergency Medicine: ED-based and -trained Attendings Outperform Attendings from Hospital Departments Rotating in the ED

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ABSTRACT

Introduction: In Greece, Emergency Departments (EDs) are currently staffed with medical personnel without formal training in Emergency Medicine (EM). These attendings come from various medical specialty training backgrounds. The aim of the study was how ED-based attendings who have been trained in the ED for more than a year, can handle medical emergency cases compared to attendings from other medical department in terms of ED length of stay (ED-LOS).

Methods: This is a retrospective observational study. We examined the "waiting time "(Time between ED arrival/triage and Time first seen by a Physician?) and the duration between when patients were first cared for in the ED by a physician until the decision to admit or discharge ("Care Time") (Time between Seen by physician AND Disposition). We recorded time periods from 18 different days from the EMR dataset. The study was conducted in a large ED in Athens, Greece, with 120,000 ED visits per year. We enrolled 5572 medical patients who visited the ED. The IBM SPSS v.27.0 statistic program was used for statistical analysis.

Results: The total "waiting time" of patients was 164.1±255.9 min and the "care time" of patients was 41.3±74.1 min. The ED-based attendings had significantly less patient waiting time (126.4±264.7 vs. 199.1±243.2, p=0.008) and fewer patients were waiting to be seen (2.1±1.9 vs. 4.6±4.1, p=0.001) than attendings from other medical department rotating in the ED. The ED-based attendings had significantly less time investigating and treating patients in the ED than the attendings from other medical departments (37.3±76.8 vs. 45.6±70.9, p=0.048).

Conclusion: Our study confirms that EM training can improve the quality of care, by decreasing waiting time, workup and management time in the ED. Greater benefits should be expected as Greece develops formal EM residency training.

Keywords: emergency physicians; medical attendings; emergency departments; length of stay; waiting time

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INTRODUCTION

Emergency Departments (EDs) are usually the first contact people have with the healthcare system and offer essential care for diseases and injuries. Based on their mandate, EDs should provide efficient diagnosis and management of numerous patients. This mandate is constantly challenged by the increasing number of incoming patients, shortages in resources and staff, and the increasing

complexity of presenting symptoms.[1] This has led many EDs into overcrowding challenges that increase the patients' waiting time and the average length of stay in the ED.[2] It has been well identified in the literature that overcrowding directly impacts the quality of patient care and is becoming an important aspect of public health. Crowding is defined as unexpected deterioration and patient volume that cannot be transported and treated efficiently by the ED.[2, 3] Overcrowding leads to longer waiting times resulting in congestion, increased unfavorable patient outcomes, low patient satisfaction, and increased health costs.[2, 4-6]

In the Greek health care system, Emergency Medicine and Emergency Nursing were established after 2019.[7] Although training sites for the specialty of Emergency Medicine are constantly increasing, the vast majority of attendings placed in Greek EDs have no formal training in Emergency Medicine. These ED attendings come from various specialty training backgrounds (mostly from internal medicine, Cardiology, and General Practice). Even so, most Greek EDs are not sufficiently staffed for ED attendings to autonomously manage all ED incoming patients. These EDs heavily rely on attendings and residents from hospital departments to rotate in the ED to provide care for Emergency cases. Such rotating attendings and residents have a specialized scope of practice or training that is understandably narrower than what is required by the wide unpredictable variety and diversity of clinical pathology and acuity. Their performance is typically being overseen and supervised by the heads of the clinical departments they are originally or primarily appointed to. This system has several negative effects on ED flow. First, beyond estimating patient acuity, ED triage must also facilitate the development of a working diagnosis and guide the patient toward the specialty most capable of providing definitive management.

As the field of practice of most ED attendings is limited by their primary specialty training, an increased number of consults is needed for each patient, further affecting ED throughput. Finally, rotating attendings have an established mind frame: they follow in the ED practice guidelines and clinical protocols which they developed from years in their disciplines. Such practice increases patients' length of stay in the ED.

The benefits of having board-certified EM attendings in the ED have been well established.[8] We know that when EM attendings are engaged in the ED, key decisions affecting patient management are made quicker and more efficiently. Benefits such as prompt diagnosis and treatment reduce ED length of stay (LOS) and alleviate possible adverse outcomes. Furthermore, EM attendings use ED-derived evidence-based protocols and guidelines that may further reduce patient LOS in the ED while providing optimal care. Combining clinical expertise and of standardized care pathways, EM attendings have a positive effect on avoidable delays, and can overall shorten the ED LOS.[9, 11, 12] As a result, Healthcare organizations are always seeking ways to improve patient care by optimizing operational efficiency, by including the recruitment of Emergency Medicine (EM) attendings.

Having recognized the above at Nikaia Hospital ED, all newly appointed attendings undergo continuous training independent of their primary specialty background. This training is both theoretical and practical, covering most aspects of the European Training Requirements for the Specialty of Emergency Medicine (UEMS ETR) for Emergency Medicine. Training is provided by attendings of various medical specialties from the hospital, through lectures and clinical rotations. Training is also provided by the Hellenic Society for Emergency Medicine (HeSEM) offering lectures, scientific meetings and certified skills courses. More advanced training is provided by experts from countries with developed EM, visiting Nikaia ED as visiting professors. Although we recognize that formal residency EM training cannot be substituted in full by in-house training programs, we believe that is a first step progressing toward the development of categorical EM residency training and towards achieving excellence in the practice of EM.

To test the clinical effects of our training program, we conducted this study to investigate the effect on waiting times, ED-LOS, and time of the disposition decision of ED patients. We compared the performance of ED-based EM-trained attendings to Internal Medicine (IM) attendings rotating to the ED. This comparison was limited to patients seen by both groups in the IM section of the ED. The major tested hypothesis is that trained ED-based attendings can implement their mind frame, knowledge, and skills to reduce the ED-LOS of patients.

In Nikaia Hospital Emergency Department

Triage is run by nurses and/or ED attendings. We use a 5-scale multi-layer triage protocol.[10] Priority 1 and 2 patients are directed to the resuscitation area immediately; Priority 4 and 5 patients are directed to our fast-track area. Priority 3 patients are directed in the main treatment area to a certain medical specialty; these patients will wait at the waiting area until a spot is available under the observation of triage personnel.

MATERIALS & METHODS

This is a retrospective observational study. We examined the "Waiting time to be seen" (time from ED triage until time before seen by a treating physician) and the "Disposition time" that patients were investigated and treated in the IM section of the ED (time of the start of care until discharge or admission). We chose random recorded time periods from 18 different shifts (second half of 2023, 8 a.m. to 8 p.m.) from the EMR dataset. The study was conducted in a large ED in Athens, Greece, with 120,000 visits per year. The study focused on the IM section of the ED, to which ESI 2-4 patients are referred by either ED triage or EMS services.

In the "Observation group", the IM section of the ED was run by board-certified IM attendings working at the department of Internal Medicine at Nikaia Hospital, who rotate in the Emergency Department covering shifts (Rotating Medical Department Based Attendings - RMDBA). All RMDBA attendings had a > 5 years of working experience in the IM department post-residency. During their ED shifts they are joined by residents based at Nikaia Hospital IM Department. They practiced in the ED abiding to established rules and protocols set by Nikaia Hospital Department of Internal Medicine .

In the "Intervention group", the IM section of the ED was run by board-certified IM attendings with placements in the Emergency Department (Emergency Department Based Attendings (EDBA). All EDBA had < 3 years of working experience exclusively in the ED post-residency, and had undergone structured department-based training on key aspects of EM. All EDBA had completed their IM residency training in Nikaia General Hospital. During their ED shifts they are joined by residents based at Nikaia Hospital IM Department.. They practiced in the ED abiding to rules and protocols set by the Emergency Department.

A total of 2853 patients were managed by EDBA, and 2719 patients were managed by RMDBA group.

The IBM SPSS v. 27.0 statistic program was used for the statistical analysis. The comparison between the two groups of patients was done with t-test. The significance value of the analysis was set to 0.05.

The study protocol was reviewed and approved by the Nikaia General Hospital scientific and ethics committee.

RESULTS

Table 1 depicts the baseline characteristics of Emergency Department based attendings as compared to rotating medical department based attendings. The study included 5,572 patients. Baseline characteristics were similar between Emergency Department–based attendings (EDBA) and rotating medical department–based attendings (RMDBA). Both groups covered the same number of 12-hour shifts (n = 8) during the same study period (August–December 2023), with comparable triage acuity levels (categories 3–4) and equivalent staffing structures, including one attending and three to four internal medicine residents per shift. No statistically significant differences were observed in patient volume, EMS arrivals, or admissions per shift ($p > 0.05$).

Table 2 depicts Management Comparison Between ED-Based and Non-ED-Based Attendings Rotating in the Emergency Department. Compared to non–ED-based attendings rotating in the Emergency Department (RMDBA), Emergency Department–based attendings (EDBA) were associated with significantly shorter patient waiting times (126.4 ± 264.7 min vs. 199.1 ± 243.2 min, $p = 0.008$) and reduced overall ED length of stay (37.3 ± 76.8 min vs. 45.6 ± 70.9 min, $p = 0.048$). The mean number of admissions was similar between the two groups (46.1 ± 8.1 for both). Time to admission was likewise shorter under EDBA supervision (37.3 ± 76 min vs. 45.6 ± 70.9 min, $p = 0.048$).

Table 1. Baseline characteristics of Emergency Department–based attendings compared with rotating medical department–based attendings.

	ED BA Group	RMD BA Group	p
Triage allocation	Medical	Medical	
Triage acuity priority	3-4	3-4	
Number of shifts studied (12-hour shifts) (08:00 – 20:00)	8	8	
Period studied	8/2023-12/2023	8/2023-12/2023	
Total number of patients examined	2853	2719	>0.05
Patients admitted per shift	44.3±7.6	47.9±8.5	>0.05
EMS arrivals per shift	44.4±5.5	42±6.2	>0.05
ED admissions discharged from the medical ward within 24h	2 ±1	2 ±1	>0.05
Attendings Medical Specialty Certification	Internal Medicine	Internal Medicine	
Attending experience post-residency	<3 years in the ED	>5 years in the IM Department	
Attendings per shift	1	1	
Number of residents per shift	3-4	3-4	
Resident qualifications	Medicine residents rotating from the Internal Medicine Department	Medicine residents rotating from the Internal Medicine Department	

EDBA = Emergency Department-Based Attendings

RMDBA = Rotating Medical Department Based Attendings

Table 2. Management Comparison Between ED-Based and Non-ED-Based Attendings Rotating in the Emergency Department

	EDBA	RMDBA	P - value
Waiting time	126.4±264.7	199.1±243.2	0.008
ED LOS	37.3±76.8	45.6±70.9	0.048
Number of admissions	46.1±8.1	46.1±8.1	-
Time to admission	37.3+ 76	45.6 + 70.9	0.048

EDBA = Emergency Department-Based Attendings

RMDBA = Rotating Medical Department Based Attendings

DISCUSSION

To our knowledge, this is the first study to assess the benefits of training in the core aspects of EM. Furthermore, it is the first study conducted in Greece investigating the efficiency of ED-based attendings versus other medical department attendings in managing ED patients while rotating in the ED. Waiting time and time to final disposition decision of patients was significantly lower when patients were examined by ED-based attendings than rotating medical department attendings. A decrease in waiting time has been correlated with increased quality, advanced ED patient`s satisfaction,[11] and reduced mortality.[12, 13] A study in the UK foundthat the presence of an emergency physician in the ED increased safety and decreased the number of patient complaints.[13] Similarly, a study in the USA demonstrated that the presence of an emergency physician in the ED increased the safety of the department and decreased the number of patient complaints.[14]

In line with our results, a study conducted in

Australia demonstrated reduced waiting time and a better flow of patients from the ED to clinics they were admitted to.[15]

When lacking board-certified emergency physicians, many EDs are staffed with other physicians from other specialties and departments, such as general physicians, surgeons, internists, etc. to fill their needs. Without these physicians, a lot of EDs would be unable to provide emergency care to all incoming patients.[16] The problem is more intense in rural hospitals.[17] For this reason, the staffing pattern is often mixed with nurse practitioners and physician assistants having a wide role in providing care.[18]

EDs in Greece have similar staffing trends. Athens is the capital of Greece. Most EDs in Athens are staffed with a mix of EM and non-EM physicians, due to the delayed recognition of the specialty in Greece. In recent years, the state has increased efforts to staff EDs with emergency physicians, yet their numbers remain inadequate Camargo et al (2008) developed a formula that calculated the number of emergency physicians necessary for the proper operation of an ED as required number of doctors annual number of ED patients / 3548.[19] The British College of Emergency Medicine recommends 12-16 certified emergency physicians for basic coverage in an ED with 100,000 visits per year.[20, 21] Our ED lacks the necessary number of EM attendings to operate autonomously by either formula. Currently Nikaia ED is staffed with only 2 certified emergency physicians and 11 non-EM-certified attendings. This gap is covered by doctors of various specialties providing care to patients with corresponding health problems. Similar patterns are still seen worldwide.[20, 22]

In order to bridge the gap between EM-residency-trained board-certified EM attendings[7] and board-certified attendings of various backgrounds placed in the ED, a department-based training program has been implemented since 2020. This program consists of clinical rotations of all new ED attendings in the ICU, in the department of Anesthesia, and the Department of Medical Imaging. Lectures covering most of the European Union of Medical Specialists European Training Requirements UEMS ETR on EM are attended once a month in the department by specialists from the Hospital. All Nikaia ED attendings are expected to attend the theoretical training program provided online by HeSEM two times per month. Our ED through international collaboration hosts visiting professors of EM once a year. During their stay, our esteemed guests provide theoretical and practical training in ED operations and EM skills and knowledge. All attendings are encouraged to participate in certified courses like ATLS, ALS, EMCC, Ultrasound, etc. Every effort is being made to facilitate participation in National and International EM meetings. In-department literature review and case reviews are held regularly. Our main barrier to continuous medical training is the financial burden required. In Greece Medical Doctor's salaries remain among the lowest in the EU and provisions have not been made by the state to fund ongoing medical training.

This department-based training has widened the scope of practice of all attendings staffing the ED beyond the safe zone of their original residency training. This study highlights the positive effect of this structured training in their clinical practice compared to highly-trained and experienced attendings from Hospital departments rotating in the ED. It can be assumed that fully staffing the Greek EDs with residency-trained EM attendings will have an even greater impact on ED operations by providing timely care promptly and thus increasing efficiency and patient satisfaction. Until then ED-based training for all attendings assigned to rotate in the ED should become a priority for policymakers and managers. They should develop provisions & regulations and allocate financial and non-financial resources for the proper and sustainable recruitment, training, administration and retention of adequate numbers of ED attendings to optimally staff the EDs in Greece.

CONCLUSIONS

The ED length of stay as well as the time for patient investigation and management are used by healthcare administrators and leaders as quality indicators for the care delivered in the ED. The longer these times, the higher the patient dissatisfaction and the worse is their outcome. Our study confirms that ED-based attending, who have attended structured Emergency Medicine focused training, even without formal EM-training, can improve the quality of care delivered in the ED and will greatly affect these crucial indicators.

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