

Emergency medicine residents in Italy: Data from a national survey

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Abstract

Emergency Medicine (EM) is a novel specialty in Italy. It exists only since 2009, and CoSMEU (Coordinamento Specializzandi Medicina d'Emergenza-Urgenza) is the national association of EM residents. On behalf of CoSMEU, we conducted an electronic survey open to all the Italian EM residents, with the aim to assess their awareness about the acquisition of technical skills and clinical knowledge during the academic year 2019-2020. Out of 1666 EM residents, 434 (26%) responded to the survey, in representation of all the 33 medical school programs. For 63.6% of them EM was their first-choice program. A high percentage of EM residents have denounced a lack of education and hands-on opportunities to fully complete their training as planned, in the absence of simulation and certifications, and with not-standardized educa-

tional programs across the EM schools. Although the Italian EM and specialty are currently facing a crisis, all the EM residents are working hard to support EM system optimization.

Introduction

The first Emergency Medicine (EM) residency program was launched by the University of Cincinnati in Cincinnati, Ohio, in 1970,¹ while in Europe it is a novel specialty, present in Italy since 2006, even if a specific training of residents in the specialty of EM was established only in 2009.² The Italian EM program contemplates a five-year program, which enables residents to master the many diagnostic, procedural, and multidisciplinary liaison skills, that are required to become an EM physician. Communication and leadership skills are demanding, but pivotal to work efficiently and to deal with patient distress and family expectations in very difficult situations.³ CoSMEU (Coordinamento Specializzandi Medicina d'Emergenza-Urgenza) is the national association of EM residents in Italy, that was born in 2017 with the aim to enhance a standardized training, to safeguard the interests of EM doctors in training, to develop opportunities and to formalize specific academic paths.⁴ We conducted a survey on the academic year 2019-2020 to assess the Italian EM residents' awareness about their level of education, skills achievement and future perspectives. With our poll, we also tried to verify the differences in the educational programs of the Italian EM schools as a first step to standardize the educational program.

Materials and Methods

An electronic anonymous survey was primarily made available, via social media and e-mail, to all the Italian CoSMEU EM residents' members during the academic year 2019-2020. The survey consisted of multiple-choice and free-text questions, including satisfaction scales about the strengths and weaknesses of EM training programs (Appendix 1). Collected data included demographics, year of specialty, numbers and type of rotations per year and the satisfaction rate in a scale from 1 to 5. We also collected data about the educational offer, including lessons, simulations, certifications and any periods abroad. We investigated aspects concerning future professional careers, to understand whether the Italian EM residents would prefer to work in an emergency department (ED) and/or in the pre-hospital setting. Finally, we asked 4th and 5th year EM residents how confident they felt in treating medical and surgical diseases and performing emergency procedures.

Statistical analysis

Continuous variables were expressed as median and interquartile range. Categorical variables were reported as counts and percentages.

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Availability of data and materials: All data underlying the findings are fully available.

Ethics approval and consent to participate: Not applicable. This is a national survey promoted by CoSMEU and not involving patients.

Informed consent: All residents chose to fill in the form in an anonymous way, knowing that the results could be published.

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Results

EM residents' rotations and training

Out of 1666 EM residents, 434 (26 %) responded to the survey, representing all the 33 medical school programs in Italy (Figure 1). Most of the residents were attending the first (187, 43%) and second (118, 27%) year of specialty, reflecting the increasing number of residency positions available (Table 1). 276 (63.6%) residents stated that EM was their first choice, while 109 (25.1%) acknowl-

edged that EM had not been their first choice, but that they had changed their idea and they were now convinced and passionate about EM. During the whole five-years program, each resident attended several specialties, including: internal medicine (mean time per rotation: 6-12 months, rate 2-24 months), EM department (>18 months, rate 12-24 months), intensive care unit (ICU) / anesthesiology (3-6 months, rate 0-12 months), pre-hospital care (2-3 months, rate 2-24 months), cardiology (2-3 months), pediatrics (1-2 months), obstetrics (1 month), and a variable period (6-18 months) of elective activities, such as trauma, toxicology and spe-

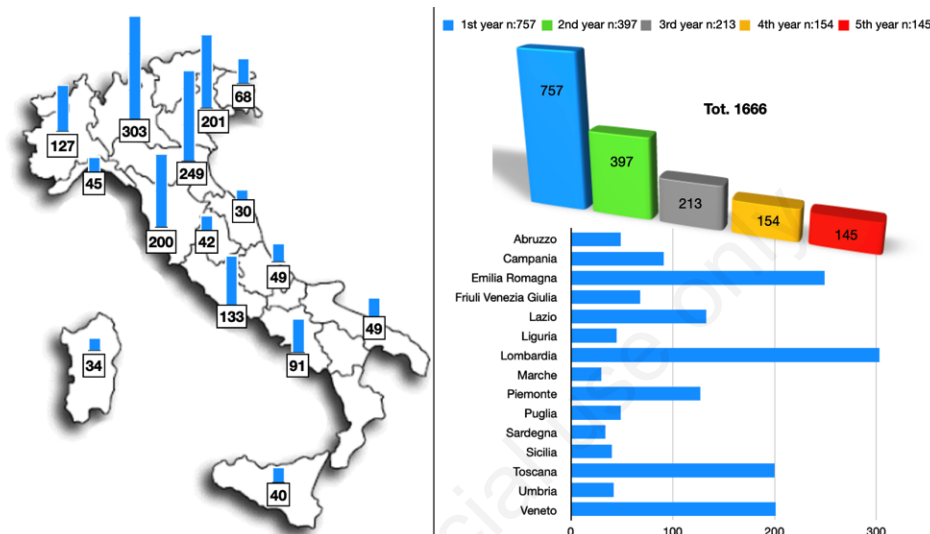


Figure 1. Distribution of EM residents by geographic area and year of training.

Table 1. Emergency medicine residency programs in Italy. National data, curriculum and teaching.

| | Survey participants N=434 | Total EM residents N=1663 |
|---|------------------------------|------------------------------|
| Year of residency program | | |
| First year, n (%) | 187 (43.1) | 757 (45.5) |
| Second year, n (%) | 118 (27.2) | 397 (23.8) |
| Third year, n (%) | 72 (16.6) | 213 (12.8) |
| Fourth year, n (%) | 29 (6.7) | 154 (9.2) |
| Fifth year, n (%) | 28 (6.5) | 145 (8.7) |
| Number of school programs | 33 | |
| Emergency medicine program as first choice, n (%) | 276 (63.6) | |
| Exchange program allowed, n (%) | 297 (68.4) | |
| Teaching | | |
| Frontal lessons once a month, n (%) | 208 (48) | |
| Frontal lessons more than once a month, n (%) | 226 (52) | |
| Topics inherent to emergency medicine, n (%) | 217 (50) | |
| Journal club, n (%) | 190 (44) | |
| Simulations, n (%) | 90 (20.7) | |
| Certifications granted, n (%) | 134 (31) | |
| Curriculum | | |
| Internal medicine | Mean period (months) | Median approval rating (1-5) |
| Emergency department | 6-12 months | 3 |
| ICU/Anesthesiology | >18 months | 5 |
| Pre-hospital care | 3-6 months | 2 |
| Pediatrics | 2-3 months | 4 |
| Cardiology | 1-2 months | 2 |
| Obstetrics | 2-3 months | 2 |
| Elective | 1 month | 2 |
| | 6-18 months | NA |

cialistic emergencies. The average time scheduled for each rotation is highly variable across different programs: for example, some schools do not have rotation in ICU and pre-hospital care; and toxicology is mandatory for some schools, but elective for others.

Residents' satisfaction for their training rotations (range from 1: no satisfaction; to 5: full satisfaction or if they have not been in this rotation yet) is highest for the EM rotation (median rate of 5) and low-est for ICU / anesthesiology, cardiology, pediatrics and obstetrics (median rate of 2). 68,4% of the EM residents are allowed to be involved in an exchange program period with other Italian hospitals or abroad, and CoSMEU was often a sponsor of these programs (Table 1).

About the teaching programs, residents stated that in 52% of cases their program contemplates frontal formal lessons more than once a month. Only in 50% of cases these lectures discussed EM topics. In 44% of the EM programs journal clubs were planned and, only in 20,7% of cases, residents could participate to simulations. Only 134 (31%) residents reported that certifications, such as ACLS, ATLS, and PALS, were granted by their university (Table 1). This proportion is equally distributed between all the five years of the training program. In 70% of the universities, certifications are not, or not all, part of the training program.

Medical skills

The median scores for different skills graded on a scale ranging from 1 (no satisfaction) to 5 (full satisfaction) were: 4 and 3 for medical and surgical emergencies respectively, 4 for resuscitation, clinical ultrasounds and Non-Invasive Ventilation (NIV), 3 for trauma skills, 2 for pediatrics and specialist emergencies and 1 for obstetric emergencies. Considering the 4th and 5th year EM resi-

dents, 54 (95%) of them stated that they are independent in peri-procedural sedations, 51 (89%) are independent in central lines placements and in electric cardioversion, 47 (82%) feel comfortable in airway management and endotracheal intubation (ETI), and 19 (33%) feel confident in chest drainage placement. On the other hand, only 8 (14%) declared to be independent in bone plaster, and 7 (12%) have been involved in delivery only under supervision (Table 2).⁵

Ninety-three (21%) residents stated that they will start a new residency program after the EM specialty, preferring anesthesiology, cardiology, general practice and internal medicine for 31 residents (33%), 24 (26%), 13 (14%), 12 (13%), respectively.

The desirable workplace would be a combination of EM department and pre-hospital care for 235 (54%) residents, emergency room only for 112 (25.8%), EM ward and critical care units for 73 (17%), and pre-hospital care only for 14 (3%) (Table 2).

Discussion

The main limit of our study is the small sample size, that represents only 26% of the Italian EM residents, but we believe that it is well representative of the whole Italian EM resident population in terms of distribution within the five different years of training program and the geographic area. The majority of the residents involved in the survey belongs to the 1st and 2nd year of the specialty, reflecting the increasing number of residency positions in the last two years. The first finding of this survey concerns the satisfaction rate for the different training periods: as expected, the high-

Table 2. Emergency medicine residents skills and future perspectives.

| Skills | Score (1-5) |
|--|-------------|
| Medical emergencies | 4 |
| Surgical emergencies | 3 |
| Resuscitation | 4 |
| Trauma | 3 |
| Pediatric emergencies | 2 |
| Obstetric emergencies | 1 |
| Specialist emergencies | 2 |
| Ultrasounds | 4 |
| Non invasive ventilation (NIV) | 3 |
| Autonomy in the invasive procedure (only for the residents of last 2 years of program) | N=57 |
| Periprocedural sedations, n (%) | 54 (95) |
| Chest drainage, n (%) | 19 (33) |
| Central lines, n (%) | 51 (89) |
| Endotracheal incubation (ETI), n (%) | 47 (82) |
| Electric cardioversion, n (%) | 51 (89) |
| Childbirth (only under supervision), n (%) | 7 (12) |
| Bone plaster, n (%) | 8 (14) |
| Future | N=434 |
| Desired workplace | |
| EM department + prehospital care, n (%) | 235 (54) |
| Emergency room, n (%) | 112 (25.8) |
| EM ward/critical care, n (%) | 73 (17) |
| Pre-hospital care, n (%) | 14 (3) |
| Willing to start a new residency program after EM | 93 (21) |
| Anesthesiology and ICU, n (%) | 31 (33) |
| Cardiology, n (%) | 24 (26) |
| General practice, n (%) | 13 (14) |
| Internal medicine, n (%) | 12 (13) |
| Other, n (%) | 13 (14) |

est rate is for the EM rotation, but there is a very disappointing rate (about 2) for the ICU/anesthesiology, cardiology, pediatrics and obstetrics training periods. We believe that the main reason of this negative endpoint can be a common difficulty of the specialists, who “host” EM trainees in their wards, to understand which are the target skills and expertise that should be reached and developed by the EM residents, as a consequence of the lack of a scheduled training program. Indeed, it is not uncommon that EM residents need to justify the reasons of their shifts in these wards and their will to learn different approaches and procedures. It is also clear that there are wide differences in scheduling practices and consequently, on the training experience in the different areas and university programs in Italy.⁵ A standardized school program should be planned as soon as possible.

Even if very different, teaching programs and rotations are quite well organized throughout the national territory. The main requests of residents are that lessons be most frequently focused on EM topics, with a more “practical” approach and more simulations. Only 20,7% of EM residents have the chance to participate constantly in simulations. This is an important limit of our training education. We strongly believe that if we want to manage properly emergencies with skills and accuracy, we need to do professionally supervised simulations and learn to work in team.^{6,7} For the same reasons, it is mandatory for all the EM residents to have the possibility to conclude their training after obtaining all the main emergency certifications, that are essential for practicing with the adequate skills and with a minimum level of confidence both in the emergency room and in the pre-hospital setting.⁸ Diagnostic and procedural skills, including airway management, vascular and cavity access, resuscitation, and trauma care are fundamental for our training. EM residents feel reasonably comfortable in treating medical emergencies, NIV and air management; on the other hand, there is still a long way to go for acquiring a standard level of skills in the pediatric, obstetric and trauma emergencies.

The most relevant issue highlighted by our survey is the EM trainee opinion about their professional future. Recently, Poggiali *et al.* discussed the crisis of the Italian national health system, pointing out the current Italian (but not only) situation of the emergency medicine and specialty,⁹ and Coen *et al.* tried to outline the possible solutions for this dramatic scenario.¹⁰ However, despite the belief that EM specialty is now considered one of the last options and abandoned whenever possible due to the current challenging working conditions, a significant number of newly graduated doctors starts this training program every year. In a recent letter by Borio, the author attributed the reasons of the crisis of EM specialty to the lack of certainties, protection and recognitions.¹¹ While writing, there are more than 1600 EM residents throughout Italy, and their number is expected to grow every year. In our next survey we will evaluate and discuss both the reasons why 21% of residents want to start a new specialty after EM, and the consequences of the above-mentioned EM critical situation in Italy.

Conclusions

Based on our results, we can state that residency training in EM can be considered the next challenge of the 21st century medical education in Italy. Many Italian EM residents perceive a lack of educational and practical opportunities to fully complete their training. There is still a significant heterogeneity among local training programs, and the EM specialty specific competences have yet to be fully recognized by other specialists and institutions. Despite objective difficulties faced by the national EM system, residents are willing to be part of the improvement process, as reported by Borio.¹¹

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