Archives of Academic Emergency Medicine. 2023; 11(1): e13

ORIGINAL RESEARCH

Comparing the Emergency Medicine Residency Programs in Iran and around the World; a Descriptive Study

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Received: October 2022; Accepted: December 2022; Published online: 1 January 2023

Abstract: **Introduction:** To identify the strengths and weaknesses of emergency medicine residency curriculum in Iran, and to benefit from the experiences of successful universities, comparative studies are crucial. This study compared the components of the national curriculum of emergency medicine in the United States, Canada, the European Union, Australia, and Saudi Arabia with Iran. **Methods:** Data for this research was collected by searching the websites of different universities and also contacting them for requesting curriculums. The leading countries in emergency medicine and one of the countries in the Middle East region (Saudi Arabia) along with the World Federation of Emergency Medicine were selected as the sample. The model used in this field is a range model that identifies four stages of description, interpretation, proximity, and comparison in comparative studies. **Results:** In the curriculum of the United States, Canada, the European Union, Australia, and Saudi Arabia, there were lots of similarities in expressing the general characteristics of the curriculum, mission elements, vision, values, and beliefs of the discipline, educational strategy, techniques, expected competencies, rotation programs, and evaluation method, which were also similar to the Iranian curriculum. However, the duration of residency for emergency medicine in Iran is three years, which is shorter than other countries. As expected, the number and duration of rotations are less than other countries. Also, the process of entering into this field is different in Iran and is based on an exam for entrance, while most other countries use self-requested residency program. **Conclusion:** Considering the results of comparing the Iranian curriculum with the curriculums of the United States, Canada, the European Union, Australia, and Saudi Arabia, it seems that Iran's program is comprehensive and complete; but, a reappraisal of the course duration and entering options are necessary to eliminate or improve the inadequacies.

Keywords: Comparative Study; Curriculum; Education; Internship and Residency; Emergency Medicine

Cite this article as: Talebi M, Talebi Doluee M, Jafari MA, Moghaddam HZ, Foroughian M, Moazzami M, et al. Comparing the Emergency Medicine Residency Programs in Iran and around the World; a Descriptive Study. Arch Acad Emerg Med. 2023; 11(1): e13. https://doi.org/10.22037/aaem.v11i1.1867.

1. Introduction

The residency program in clinical specialties is one of the higher university education courses, through which eligible applicants with a doctor of medicine degree can achieve their specialist degree after passing the residency exam, theoretical and practical training courses, and the exams (formative and final) (1). Emergency medicine is a clinical specialty that evaluates, resuscitates, stabilizes, diagnoses, and cares for patients with emergency conditions. This specialty in-

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cludes basic medical science, necessary clinical knowledge, appropriate skills for diagnosis, decision making, and treatment of patients referred to the emergency department, as well as handling emergencies in the inpatient ward. The specialist in this field should also be able to work as an effective member of the medical team with specialists in other fields as well as the pre-hospital emergency system (2).

The founders of emergency medicine in Iran, collected and analyzed about one hundred educational lesson plans related to emergency medicine in different countries (America, Canada, England, Australia) and the conditions of providing emergency services in many parts of the world, and finally drafted and announced the plan, in 2001. A team of 8 specialists were selected and sent to the United States for a supplementary course of emergency medicine, and in a very intensive program with the coordination of George Washington University, they succeeded in completing the fellowship course in emergency medicine and later started educational residency programs in Iran (2).

Currently, a national emergency medicine training program is available or underway in more than 35 countries. In Iran, in 2001, Iran University of Medical Sciences and later, in 2004, Tehran and Shahid Beheshti universities of medical sciences, have launched the residency program and started accepting residents in emergency medicine. At the moment, the total number of universities with specialized fields of emergency medicine is fifteen (2). Universities are obliged to train graduates capable of disease prevention and treatment, and public health improvement (3). Systematic and comprehensive teaching programs (curriculum) that are consistent with the healthcare system requirements are pillars of this training (4). Curriculum evaluation is an integral part of assessing the training programs in the Ministry of Health, Treatment and Medical Education. Medical training programs need to be constantly reviewed and efforts should be made to improve them by eliminating shortcomings (4, 5). Given the vast changes that are taking place in the field of health and clinical sciences, it is certainly not possible to meet the professional needs of clinical jobs in today's world with a traditional curriculum (5). The need for change in education is so obvious that experts have already rejected the question "Is change necessary?" and believe that the question should be "What changes are necessary? " (6). According to the researches, educational administrators and programmers should modify their curriculum based on goals and continuous evaluation so that students receive sufficient scientific and educational care. They should also review and revise subjects in which students' ability is reported to be poor (7). One of the research methods for updating the educational programs is the conduction of comparative studies. A comparative study is a practice in which two or more phenomena are put together and their differences and similarities are analyzed (8). Comparative studies are a rational strategy for using the experiences of other universities. By coordinating their information and programs with the financial conditions and local and indigenous considerations of our country, better programs can be developed so that human and financial resources can be used in more efficient ways (9). In almost all societies, educational issues and goals are similar, but methods and planning are different. Educational methods, planning, and problem-solving in each society are related to their tradition and culture (10). Therefore, numerous comparative studies have been conducted to compare the curriculum of different countries in primary medical education (11, 12), laboratory sciences (8), internal medicine (13), educational planning (14), and Science Education (15). Due to the stated needs and knowledge gap regarding the comparative comparison of the emergency medicine curriculum, this study is performed for preparing the prerequisites and backgrounds for modifying the emergency medicine curriculum in Iran. The purpose of this study is to compare the specialized curriculum of emergency medicine in Iran and selected universities from around the world to compare the different areas and dimensions of the emergency medicine curriculum.

2. Methods

2.1. Study design and settings

This is a cross-sectional with comparative design, which has been approved by the Vice-Chancellor for Research of Mashhad University of Medical Sciences, Mashhad, Iran, (Code: 950021). The literature used for this study was reviewed from January to March 2022. The researchers first visited the websites of different universities and then contacted the University for their emergency medicine specialty training program. Then, they consulted with some members of the Board of Emergency Medicine, and some of the universities that fitted the purpose of this study were selected.

2.2. Data gathering

In this selection, an attempt was made to select a sample from different parts of the world, especially neighboring countries. Specialized medical training programs, especially emergency medicine, in each part of the world have a special eye for the needs of the people of the region, and these needs are completely different from one country to another and from one region to another. Eventually, the United States, Canada, the European Union, Australia, Saudi Arabia, and the World Federation of Emergency Medicine, which is homogenous with many other curriculums, were selected.

Another point is the selection of prototype programs approved by the educational program accreditation organizations in each country, and no attention has been paid to the minor changes that each university may make in these

programs. Since the variables required for the study may not be completely consistent with predetermined patterns such as the range model, in addition to considering the range model, which includes four stages of description, interpretation, proximity, and comparison (11-16), some considerations have been made based on their importance from the viewpoint of the members of the specialized board of emergency medicine. The selected curriculums were fully studied. In the next step, a table was prepared and drawn for each element of the educational program, and the names of the studied universities were placed in rows. Thus, the information about each university was organized. Then the similarities and differences in each element of the program between all the studied universities were gathered; and finally, based on these similarities and differences, a practical proposal was presented to improve each of the elements in the Iranian curriculum. The collected variables were Emergency Medicine Description Scale, Emergency Medicine Interpretation Scale, Emergency Medicine Proximity Scale, Emergency Medicine Comparison Scale, Course Venue, and Name of the country whose university curriculum is reviewed, Values and Beliefs, mission and vision, general objectives of the field, expected competencies, professional role and duties of graduates, educational strategy, teaching methods and techniques, conditions and manner of student admission, student evaluation, course length, and courses Rotation.

2.3. Statistical analysis

There are no quantitative data in this study with no statistical analyses.

3. Results

The separate results for each of the elements of the curriculum are presented here:

3.1. Introduction to the course (field)

Table 1 shows the introduction of the course and the curriculum in each of the studied educational programs. The similarities extracted from the curriculums are: The program in all universities has shown the importance of this field as a clinical specialty and the effective role of emergency medicine in the diagnosis, treatment, and management of patients with acute unclassified problems at all ages. Others include the managerial role of emergency medicine specialists in the management of the emergency department as well as pre-hospital emergencies. On the other hand, there is no major difference between curriculums.

3.2. Values and beliefs, mission and vision

Values and beliefs, mission and vision in each studied curriculum are expressed in Table 2. Since the curriculum in Iran is based on the strategic planning model, the elements of mission, vision, and values for the field of emergency medicine can also be seen in the curriculum in Iran, which is similar to the United States and Canada. Also, in all curriculums, the purpose of establishing the field is to train capable forces in order to meet the urgent needs of patients. By studying the mission of American, Canadian, and Iranian universities, we can realize the core of this mission. On the other hand, there was no section as, Vision and Values in the EU curriculum Mission. Also, in the Saudi and IFEM program, this issue was only described in a brief paragraph. The Canadian Curriculum also makes good reference to the individual competencies of emergency medical professionals. The evaluated curriculums did not directly address the category of research.

3.3. General goals

The overall objectives in the field of emergency medicine curriculum of each studied university are shown in Table 3. In all cases, the overall goal statement focused on the final result of the course and the training of specialized personnel. Also, all curriculums have mentioned the importance of preparing manpower graduating with the necessary skills and ability to deal with crisis and manage the emergency department. However, the Australian curriculum does not set goals separately and goals in the Saudi and EU curriculums are mentioned very briefly.

3.4. Expected capabilities, roles, and professional duties of graduates

The expected competencies, roles, and professional duties of the graduates in each of the studied curriculum are shown in Table 4. Competencies are similar in different curriculums and are based on medical knowledge, proficiency, communication with colleagues, the ability to work in a team, having the commitment, and sometimes research. Based on these capabilities, the curriculum framework is prepared by the accreditation organizations of each country. The differences are brief, and in each curriculum, one of the mentioned values may be less prominent.

3.5. Role and professional duties of graduates

Table 5 shows the professional roles and responsibilities of graduates in each of the studied curriculums. Information about the role of specialists and expected competencies are mentioned in a combined and undifferentiated manner in different parts of the curriculums. In general, all curriculums, directly or indirectly, emphasize the training of a capable specialist who has the ability to manage critically ill patients. In addition, their managerial role inside and outside the hospital has been emphasized.

The research and educational role of specialists also had a

place in all curriculums. The difference between the curriculums in this respect is clear. However, we can say that some differences exist in the intensity of emphasis or reference to research and educational role place in the curriculum.

3.6. Educational strategy

In some curriculums, training strategies (Table 6) are not discussed separately, so it may be best to combine the training strategy section with training methods and techniques. In the Iranian curriculum, these two parts are listed separately, so they are mentioned separately in this study. In the different curriculums, there is an unorganized reference to personal learning, central teacher, providing learning opportunities, giving feedback, and so on. Despite the use of different words in the study of all curriculums, it seems that all these cases have been considered. The curriculum in the United States, Australia, and Europe have not specifically addressed this issue and it has been addressed under the heading of teaching methods and techniques.

3.7. Teaching methods and techniques, study method (virtual - face-to-face)

It should be noted that this section includes two separate elements of teaching methods and techniques and study methods (Table 7), which are expressed together due to overlap in the different curriculums. In some curriculums, even educational strategies are given in this section. In all curriculums, teaching methods and techniques are very similar as follows: different methods of clinical education, skills training, classroom combination, lectures, group learning, journal club, etc. On the other hand, in the European curriculum, educational techniques have not been specifically addressed. Some curriculums, such as Australia, also place more emphasis on e-learning.

3.8. Conditions and manner of student admission (entry conditions)

Table 8 shows the conditions and manner of student admission (entry conditions) in each of the studied curriculums. In Saudi Arabia, as in Iran, residents are selected through entrance exams. In studied countries other than Iran and Saudi Arabia, individuals were selected based on the candidate's request and review of his/her records and the opinion of the residency director.

3.9. Student Assessment

In all universities, very different methods have been considered for the developmental and general evaluation of residents (Table 9), including theoretical and practical tests, reviewing the performance of residents in the workplace and simulated environments, the opinions of colleagues and staff, reviewing files, etc. Attempts have been made not to be satisfied with a few limited methods and to make the evaluations as objective as possible. On the other hand, there are so many differences in all aspects of evaluation that no specific difference can be pointed out.

In the American Curriculum since 2008, when the milestone project was launched, the focus was on assessing the ability of residents as a criterion for the success of the course. Seventeen competencies were considered as the main competencies for each category of residency (for example, at the end of the first year of residency) and the level of competency was determined based on objective criteria. The resident must have reached this level of capability in order to be promoted to a higher year.

3.10. The length of the specialized course of emergency medicine

As Table 10 shows, in some American Emergency Medicine Centers the duration of the course is 3 years, just like in Iran. While in Canada and Australia it is a 5-year period; in the US, Saudi Arabia, and based on IFEM recommendation it is a 4-year period. In the EU it also varies from one country to another but it is at least 5 years.

3.11. Number and manner of emergency medicine rotations

In the emergency medicine course, rotations play a major role in empowering residents. On average, half of the courses are spent on rotations. Some of these rotations, such as anesthesia, pediatrics, intensive care, and internal medicine, are particularly important. In all programs, there is a lot of emphasis on rotations and their educational role (Table 11). Important rotations are the same in all programs and include anesthesia and intensive care, pediatrics, surgery, orthopedics, gynecology, and psychiatry. In some programs, like in Iran, a pre-hospital emergency period is defined. On the other hand, depending on the variety of patients in the emergency room, the duration of rotations in different programs is defined differently. The choice of rotations is left to universities to some extent. In Saudi Arabia, Hajj rotation is considered. In Iran, the duration of rotations is between 12 to 18 months of the residency period.

4. Discussion

This study aimed to compare the medical emergency residency curriculum of Iran with some other countries by matching each element of the curriculum. The similarities of the curriculums in Iran with other countries were highlighted. The fact that America has been the leading country in the introduction and development of this field is undeniable. Emergency medicine is not as old as other medical fields. Therefore, it seems that all curriculums have been

adopted from American ones. According to the gathered results, it seems that the emergency medicine curriculum is very similar to other curriculums in the first world countries and IFEM in terms of its components. Therefore, it seems that except for the duration of the course, which is shorter in Iran than in other countries, it has no problems and lapses. The approval of the emergency medicine program by the World Federation is another reason for this claim. Here, in addition to the physical examination, other components of the curriculum were reviewed again in a much more detailed manner.

4.1. The definition

Emergency medicine is a series of clinical expertise that in addition to the therapeutic role, deals with position management, planning, and dealing with crises. These cases in the Iranian curriculum, like other investigated curriculums, are quite clear and prominent.

4.2. Values and beliefs, mission and vision

Providing quality and patient-centered services in terms of medical emergencies for all ages and all cultural and racial strata in society with an emphasis on patient prioritization, as well as training of specialized human resources and emphasis on lifelong learning were common to all curriculums.

4.3. General objectives of the field

Graduation of capable forces in accordance with the needs of society, which is the same in all curriculums.

4.4. Expected capabilities

Organizations that evaluate the accreditation of educational programs in different countries of the world have considered different frameworks for the curriculum of specialized disciplines, which are called curriculum frameworks in textbooks. In the United States, this is the responsibility of Accreditation Council for Graduate Medical Education (ACGME), in Canada, CanMed is in charge and there is a similar pattern in the European Union and Australia. In Iran, this task is the responsibility of the Secretariat of the Specialized Council of the Ministry of Health. The expected capabilities mentioned in the Iranian curriculum, like all specialized curriculums of other medical fields in Iran, are exactly copied from the ACGME. Therefore, there are similarities between the Iranian curriculum and other curriculums.

In the case of skill competencies in the Iranian curriculum, skills are mentioned in two sections. The first one is a mandatory two-part section and the other one is the skills that are good to know. In other curriculums, including the American curriculum, a series of competencies have been considered as core competencies and other capabilities have been considered as ancillary skills. In this respect, there are similarities.

4.5. Role and professional duties of graduates

For this aspect, the Iranian curriculum has dedicated a part to this headline and has introduced a position of care, education, management, and research as the roles of graduates. Although not explicitly stated in some curriculums, this is the case for all graduates.

4.6. Educational strategy and teaching methods and techniques

Due to the pervasiveness and modernization of medical education, new educational principles have been considered in the Iranian curriculum and universities, so there is no difference between Iran and other countries in that manner.

4.7. Terms and conditions of student admission

In this part, there is a big difference between Iran and other countries. In Iran, the criterion for acceptance is only the score obtained in the residency exam, while in other countries, universities have the right to select a resident through a review of records and interviews, which seems necessary in the field of emergency medicine.

4.8. Student evaluation

In this aspect, just like the educational methods in our country, the latest methods of clinical evaluation of students are used and we are not different from the developed countries. Since 2008 a new way of assessing the ability of residents has been introduced in the United States. For each level of residency, a desirable level of competence was defined and the resident must have reached this level. In fact, evaluation is consequential and it does not matter if the course has been taken up or not. Given the importance of empowering graduates in this field, it is appropriate to use this method for evaluation in Iran.

4.9. Course length

According to the policy of the Ministry of Health, for faster training of specialists, the duration of the course is currently 3 years, and it is hoped that the length of the course will be increased to enrich the training program.

4.10. Number and method of rotations

Defined based on the composition of the patients who visit the emergency ward, these rotations are common to almost all curriculums. For other fields, curriculum matching has been done, some of which are mentioned here. Karimi Monaghi and Sadghat (12) Working on the study of dermatology curriculum, showed that the key elements of this curriculum are similar to the curriculum of the world's top universities. In this respect, it is similar to the emergency medicine resi-

dency program. The difference between the Iranian dermatology curriculum and the world was also the method of entering this program, in which all Iranian residency programs are different from the world.

In a similar study, Karimi Monaghi and colleagues (12) compared the master's degree program in medical education in Iran and some countries in 1991. Based on the results of matching Iranian curriculum with Dundee, Maastricht, and Calgary universities, it seems that the Iranian program is comprehensive and complete, but to eliminate the shortcomings and improve it, it was suggested that the educational goals and strategies be reviewed. The course should be presented both online and in person. The admission of undergraduate courses and lack of skills should be covered under the prerequisite courses, such as courses provided for further study and research methods in education. Due to the novelty of the medical education curriculum and its compilation by medical education specialists, the curriculum of this field can be used to review and eliminate the problems and weaknesses of the field of emergency medicine.

In another study, Kermanshahi and colleagues compared the training program for master of nursing in Iran and Canada in 2010 and concluded that the programs should be modified in terms of setting the philosophy, goals, and mission of nursing education at a complementary level so the tasks designed for the nursing program should be related to the field, realistic and in harmony with the philosophy, mission, and perspective of the field (6). Haj Bagheri (17), in a different study, has compared the philosophy, goals, and curriculum of advanced levels of nursing education in Iran and the world and concluded that nursing education program does not fit the needs of the society based on philosophy, goals, and written mission and lacks the necessary quality. According to the role and duties of nurses in health systems, practical programs and strategies can be set in different areas of nursing (7). Since the master's degree program in nursing has not changed significantly since 1995, major changes are needed to improve it. Also, the curriculum of advanced levels of nursing education in 2002 needed serious reforms. However, due to its freshness and up-to-dateness, the emergency medicine residency program has minor problems and does not require major changes. On the other hand, since the emergency medicine curriculum is written by experts in this field, it is expected that the necessary points and principles be observed in compiling the program and paying attention to the professional duties of graduates.

In 2006, Mollainejad and Zakavati (18), in another comparative study of teacher training education curriculum in the United Kingdom, Japan, France, Malaysia, and Iran, presented these strategies to improve the Iranian teacher training education system: Combining theory and practice, balancing theory and practice, development of teacher training standards, integration of information and communication technology in the program, communication between preservice and in-service training, and coordination between management institutions (9). These strategies can be justified considering the antiquity of the teacher training curriculum in Iran. In a comparative study by Jafari Harandi and colleagues, science education curriculum in Iran and several countries were compared in 2009 and it was concluded that there are significant similarities and differences between the objectives, content, teaching method, and evaluation method between the studied countries and Iran. The similarities are more in the goals and content and the intended curriculum, but the differences are more in the teaching methods and evaluation methods (15). In the present study, many similarities were observed in all objectives, content, teaching methods, and evaluation methods, and there was not much difference except for the duration of the course.

In 2009, in a comparative study by Dargahi and colleagues (19), e-Learning in the field of medical sciences in selected countries was compared. The results of their study showed that the e-learning system in Iran's medical universities has shortcomings compared to the leading universities and the success of this system requires the establishment of technological and cultural infrastructure and improving the skills required by users (8). A new e-learning system has been established in Iran following the example of other countries, so in order to improve and strengthen the system, it is necessary to use their experiences.

Mirza Mohammadi (20) has conducted a study entitled "Comparative study of the doctoral curriculum in the field of curriculum planning in Iran with foreign universities" and based on the comparison between Iran and some world-famous universities in this field, he suggested strategies to improve the curriculum of the doctoral program in the field of curriculum planning in Iran. In these strategies, it is observed that in the doctoral program in the field of curriculum planning, fundamental reforms should be made in the research department and it should be considered as an independent chapter, especially considering that the focus of research in the field of the curriculum is mainly quality. From the experiences of foreign universities studied in their research, the basics, methods, and principles of qualitative research can be taught to students in this field in Iran. This solution is similar to the results of the present study, but in another solution obtained from Mirza Mohammadi's study, it is stated that the breadth and depth of specialized subjects in the curriculum of the doctoral course in curriculum planning in Iran are weak and needs to be corrected or internships should be created. The internship is an inevitable necessity in curriculum planning for Iranian students (10). However, these problems were not observed in the emergency medicine residency training program, and this in itself indi-

cates the evolution of the emergency medicine curriculum. In the end, it is worth mentioning that the requirement of any educational program is "activity" expressed as practice (21). It is hoped that by creating favorable conditions and contexts, the existing problems and shortcomings will be eliminated and repaired, and with the full and flawless implementation of the emergency medicine residency curriculum, its goals will be achieved.

5. Limitation

One of the limitations of this study was considering a small number of emergency medicine curriculums. Curriculums from Turkey, South America, and Africa were also collected, which unfortunately were not usable due to the lack of an English version. Since in many countries, including Iran, the Ministry of Health curriculum is standard and only parts of it need to be completed by specialists, there is a so-called curriculum framework; it is suggested that a study is needed to compare these frameworks. Another suggestion is to consider the possibility of changing the approach of evaluation and programming in a study, considering the success of an outcome-oriented curriculum and the implementation of the milestone project.

6. Conclusion

Given that the field of emergency medicine is almost an emerging field in Iran and its curriculum has been newly modeled on curriculums from reputable universities, no major troubles or problems have been observed in the Iranian curriculum, but the results of this study can help the authors and curriculum modifiers in the field of emergency medicine and other similar fields in Iran to have a broader view of the development, revision, and modification of the curriculum and more appropriate selection of objectives, content, teaching methods, evaluation, and other components of the curriculum.

7. Declarations

7.1. Acknowledgments

Not applicable.

7.2. Funding Source

No funding was obtained for this study.

7.3. Authors' contribution

The contribution of each author is in the analytical search for scientific publications, writing the article and approving the content.

7.4. Funding and support

None.

7.5. Conflict of interest

None to be declared by any of the authors listed in this article.

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Table 1: Introduction of the course in the studied curriculum

Country	Introduction to emergency medicine
USA	Emergency medicine is a clinical specialty that diagnoses and treats diseases and unforeseen injuries. Emergency medicine includes all the knowledge required in the clinical model of emergency medicine. Emergency medicine works include initial assessment, diagnosis, treatment, coordination of patient care among several service providers, and assignment of each patient who needs further medical, surgical, or psychiatric services. Emergency medicine provides medical planning, foresight, and guidance for social medicine response, medical control, and health crisis. Emergency medicine professionals provide valuable clinical, administrative, and managerial services to the emergency department and other parts of the health care delivery system (22).
Canada	Emergency medicine is a discipline of medicine that includes a unique set of capabilities to evaluate, diagnose, treat, and assign tasks to all patients with injuries, illnesses, and/or behavioral disorders that require prompt care at all times (365/7/24). These conditions are often vague and include life-threatening, acute, and urgent cases (but not limited to these). This care is typically provided in a hospital; however, the scope of emergency medicine goes beyond the emergency department (23)
European Union	Emergency medicine is a medical specialty based on the knowledge and skills necessary to prevent, diagnose, and treat all diseases, emergencies, and injuries that affect people of different ages, as well as unclassified physical, behavioral, and psychological causes. This specialty is responsible for pre-hospital and hospital admissions, resuscitation, and management of all patients with emergency conditions, as well as patients who enter the emergency department with an unknown diagnosis until discharge or transfer to another specialized service. It is also responsible for establishing and managing the hospital and pre-hospital emergency systems. Emergency medicine is an interdisciplinary specialty and has a strong connection with other specialized disciplines. Emergency medicine is a complementary field.
Australia	Emergency medicine is a field of medicine that is classified based on the knowledge and skills necessary to prevent, diagnose and manage the acute and immediate aspects of diseases and injuries in patients of all age groups with a wide range of physical and behavioral problems. Besides, emergency medicine can't just be summarized in pre-hospital and hospital emergency systems (24).
Saudi Arabia	Emergency medicine is a clinical specialty that treats a wide range of diseases and acute injuries in all age groups. An emergency medicine specialist is primarily a clinician who uses high levels of clinical decision-making skills to care for acute patients and unclassified medical problems, often before complete diagnostic and laboratory information is available. An emergency medicine specialist is an academician in the community field who pilots the emergency department function, medical emergency systems, and programs, , as well as education and research in this field, intending to promote knowledge and improve the consequences of individual and social health. Definition of Emergency Medicine Specialist: Our emergency medicine specialist is the yield of a combination of medical knowledge and clinical skills. In addition to gaining skills in medical knowledge, they show their deep attitude and understanding of different clinical scenarios. They are not just emergency physicians, but diagnosticians, scholars, teachers, professors, interveners, and artists. However, emergency medicine professionals, like any other specialist in any field, are fully skilled in everything they do. Their main skill is in risk classification.
Iran	Emergency medicine is a clinical specialty that evaluates, resuscitates, stabilizes, diagnoses, and cares for patients referred to the emergency department. This specialized field includes basic science information and necessary clinical knowledge and appropriate perceptual and technical skills for diagnosis, decision making, and treatment of patients referred to the emergency department, as well as emergency department management and emergencies. Experts should also be able to contribute as a member of the medical team with specialists and cooperate pre-hospital emergency system.
IFEM	Emergency medicine is a range of clinical medicine based on the knowledge and skills needed to prevent, diagnose, and manage the acute and immediate aspects of illness, covering all age groups and covering a wide range of unclassified physical and behavioral problems. Besides, it provides an understanding of the performance of pre-hospital and hospital emergency systems and the functional skills in this system.

IFEM: International Federation for Emergency Medicine.

Table 2: Values and beliefs, mission and perspective in the studied curriculum

Country	Values and beliefs, mission and vision
USA	Mission Statement of the American College of Emergency Physicians (ACEP): The ACEP offers the highest quality of emergency care and is the main advocate for emergency physicians, their patients, and the public. Vision Statement: Emergency medicine is recognized and valued as an essential public service. Patients seeking emergency care are treated by certified emergency physicians who are supported in their practice with all the resources necessary to provide the highest quality medical care. Emergency physicians work in an environment where their rights, safety, and health are guaranteed. All patients have health care coverage that ensures access to emergency services. Legally, health care services are fully provided. Resources for the education of emergency physicians are sufficient to meet the needs of the workforce of this specialty. Emergency physicians are known and valued for their commitment to patient care, education, leadership, research, and innovation. All emergency physicians are members of the ACEP (25).
Canada	Mission Statement To save lives through patient-centered emergency care that is being transformed by educational innovations and clinical research. vision Improving health outcomes for patients of all ages through research, education, and pioneering emergency medicine. Values Integrity: We are committed, reliable, trustworthy, and we act in accordance with our values. Evidence-based decision making: We retrieve, evaluate, integrate, and measure knowledge in order to care for the patient and design a decision-making system based on the patient's social/cultural values. Accountability: We take responsibility for our actions, follow through on our commitments, and meet patients' expectations. Support: We speak for the benefit of the patient and the population, and strive for effective changes in health care providers and policymakers. Collaboration: We participate in resolving interdisciplinary issues through dialogue, mutual respect, mutual trust, and integrated action. Initiative: We have the ability to powerfully plan or change what is wrong with ourselves, our department, or our system. Critical Thinking: We systematically and continuously evaluate thinking for clarity, accuracy, bias, accuracy, logic, and relevance. Professionalism: We are committed to the health and well-being of individuals and society through ethical action, respect, cooperation, and transcendent standards of conduct (26).
European Union	not mentioned
Australia	Outlook: Australian College of Emergency Medicine (ACEM), is a trusted organization to provide professional and educational clinical standards in predicting the quality of patient-centered emergency care. Mission: Excellence in providing quality emergency care to the community through committed and expert members
Saudi Arabia	Mission: Training of young specialists to provide emergency medical services, in accordance with international standards, with compassion for patients with acute problems, to learn to strive for professional and academic excellence, to be filled with personal pride and joy; and nurture leaders and professors in this branch of medicine.
Iran	Philosophy (values and beliefs): The values that govern this program are: 1. Accepting the issue of health in all its dimensions as a fundamental human right 2. Respect for the independence of individuals in making decisions about themselves 3. Provide services to patients of any age, gender, race, religion, and social status 4. Emphasis on professional and social ethics in all dimensions 5. Emphasis on general priorities 6. Emphasis on the spirit of searching for knowledge and lifelong learning Outlook: In the next ten years, Emergency Medicine will be prominent in the fields of observing educational standards, producing knowledge, providing quality services, and producing science and research in the region. Mission: Acceptance of clinical readiness, judgment, and technical skills to be able to apply in the emergency medicine profession, to acquire and apply new knowledge and skills, and to be able to monitor their own and others' physical and mental well-being and health.
IFEM	Outlook: Creating an international curriculum model for the training of emergency medicine specialists by the World Federation of Emergency Medicine. This curriculum model is designed on the basis of the collective agreement and provides the minimum requirements for the formation and graduation of a specialized training course in emergency medicine.

IFEM: International Federation for Emergency Medicine.

Table 3: General objectives of the field in the studied curriculum

Country	General objectives of the field
USA	Training of graduates who are able to: ► Perform diagnostic and therapeutic actions, stabilization, and management of critically ill patients ► Quickly identify the problem and refer to appropriate treatment goals ► Provide effective pre-hospital care for critically ill or injured patients ► Simultaneously treat several patients ► Perform executive and educational responsibilities ► Use research methods in emergency medicine studies ► Create an environment where: ► The highest standards of emergency medical care are training, practice, and monitoring ► Focus is on the importance of the social, ethical, behavioral, or organizational aspects of emergency health care ► All personnel of the emergency ward should contribute to the resident training
Canada	Objectives: ► By graduating, a resident is expected to rise to the role of an expert to save lives and in the field of basic knowledge of the theory of this expertise, expected to have basic science and research capabilities. ► The emergency medicine specialist uses efficient methods to prioritize, evaluate, intervene, resuscitate, and subsequently manage patients until they are transferred. ► The emergency medicine specialist has organizational skills in emergency management and crisis management and has the necessary ability to deal with the crisis and play a leading role in the formation and organization of medical and pre-hospital emergency services. ► Residents must have the knowledge, skills, and attitudes necessary for effective patient-centered care from a wide range of patients. A professional must consider all moral, sexual, cultural, and racial aspects in a professional manner. The emergency medicine specialist has the ability to integrate the above with research, collection, and analysis methods.
European Union	Training of emergency medicine specialists
Australia	Not mentioned separately
Saudi Arabia	Training of emergency medicine specialists to meet the needs of the country
Iran	1) Training a sufficient number of specialists to cover all educational and medical centers providing emergency services 2) Promoting emergency research through the establishment of emergency research centers and research journals 3) Creating subspecialties in emergency medicine such as toxicology, hyperbaric medicine, and … 4) The entry of the emergency medical unit into the general curriculum of the doctoral program
IFEM	Provide a textbook of curriculum that can train physicians and specialists in emergency medicine who are able to provide the best quality of emergency services in many nations of the world where there are emergency medicine and the establishment of emergency medicine as a specialty worldwide.

IFEM: International Federation for Emergency Medicine.

Table 4: Expected competencies, role, and professional duties of graduates in the studied curriculum

Country	Expected capabilities
USA	Capabilities based on principles (ACGME) Compassionate, appropriate, effective, and timely care for patients with the goal of treating diseases and promoting health Having biomedical, clinical, and cognitive knowledge and applying it to inpatient care Ability to review and evaluate their performance in the field of patient care, collect and critique scientific documents and compare their performance with those in order to improve patient care Having communication and interpersonal skills that lead to the effective exchange of information and teamwork with the patient, his/her family, and other members of the treatment team Commitment to professional responsibilities, adherence to ethical principles, sensitivity to a wide range of patients without regard to any discrimination Awareness and sense of responsibility towards the health system in the community and the systems of providing medical services and the ability to use the resources of this system properly and effectively to provide optimal patient care.
Canada	Capabilities are presented in 7 areas in the field (CanMeds(Medical specialist Colleagues Communicator the manager researcher Professionalism Medical support
European Union	Patient care Medical knowledge Communication, collaboration, and interpersonal skills Issues related to professionalism, legal and moral issues Organizational planning and administrative management skills Education and Research
Australia	Medical Proficiency Prioritization and decision-making Connections Teamwork and collaboration Leadership and management Scholarship and teaching Professionalism
Saudi Arabia	Capabilities are presented in 7 areas: in the field(CanMeds) Medical specialist Colleague Communicator the manager researcher Professionalism Medical support
Iran	A: Capabilities [same as America curriculum Capabilities mentioned in Table 4]
IFEM	Providing comprehensive, immediate care and stabilization of the patient in an emergency, regardless of the emergency situation Managing situations that they have to make critical decisions in a short period of time to save the patient's life Giving a possible initial diagnosis and making differential diagnoses and rejecting life-threatening conditions Having the knowledge, skills, and attitude determined within the framework of the academic structure and passing all the exams and requirements for obtaining a degree from the relevant university Treatment of all patients at any age who present with an acute problem or injury or unexplained physical and behavioral symptoms Ability to coordinate and manage simultaneous care of multiple patients, including accidents with multiple casualties Determining the need for specialized consultation with other physicians Acting as a caregiver, counselor, and patient guide in the acute phase of the disease Demonstrating commitment in treating patients in all of the above situations

ACGME: Accreditation Council for Graduate Medical Education; IFEM: International Federation for Emergency Medicine.

Table 5: The role and professional duties of graduates in the studied curriculum

Country	Role and professional duties of graduates
USA	Not defined separately.
Canada	Not defined separately.
European Union	Not defined separately.
Australia	Not defined separately.
Saudi Arabia	- Medical specialist - Managerial - Educational - Cooperation in the medical system
Iran	A - In the role of care: Evaluation, resuscitation, stabilization, diagnosis, and care of patients referred to the emergency department Appropriate follow-up of patients in the emergency department and discharge or referral of patients if necessary Performing diagnostic and therapeutic measures related to the field and in accordance with what has been learned B - In the educational role: Providing training related to patients and their companions, other members of the health team, community population, and academics (if employed at the university as a faculty member) C - In the role of research: Presenting a research plan, conducting research, analyzing data, and publishing results D - in the role of management: Management of centers, wards, and emergencies, management of medical teams including trauma team, management of pre-hospital systems and emergency response systems
IFEM	During the training course, a specialist must: Have a thorough knowledge of the principles of emergencies and their immediate manifestations and be ready to apply this knowledge in different situations Study the necessary knowledge for critical care in the emergency department Acquire basic and advanced resuscitation skills, including shock diagnosis and treatment, and practical skills and demonstrate their application in simulated scenarios and real patients Be able to differentiate between common acute problems and their treatment In patients with undiagnosed problems, conduct a comprehensive evaluation, analyze clinical findings, and articulate a wide range of differential diagnosis conditions Demonstrate complete mastery in cardiopulmonary resuscitation Detect airway obstruction and take action Recognize all causes of shock at all ages and be able to intervene Be able to stabilize the patient by establishing a venous route and prescribing blood and fluids Know the principles of brain resuscitation in patients with brain injuries Have sufficient skills in using a defibrillator and other cardioversion methods Be able to prioritize patients Have the ability to interact with other colleagues to solve patient problems Have the ability to learn for life Be aware of ethical issues related to emergency medicine

IFEM: International Federation for Emergency Medicine.

Table 6: Educational strategy in the studied curriculum

Country	Educational strategy
USA	Not mentioned separately.
Canada	Not mentioned separately.
European Union	Direct monitoring Providing educational opportunities
Australia	Not mentioned separately.
Saudi Arabia	Clinical education Basic theory and knowledge training Skills training Problem-based learning
Iran	An appropriate combination of learner-centered and teacher-centered learning Combining basic and clinical sciences Systematic approach Socialism Problem-solving approach
IFEM	Providing learning opportunities Monitoring and providing feedback in the clinical environment Personal learning

IFEM: International Federation for Emergency Medicine.

Table 7: Educational methods and techniques, study method (virtual - face-to-face) in the studied curriculum

Country	Educational methods and techniques
USA	Seminars Skills workshops Patient introduction conference Journal club Group learning Patient bedside training Other methods according to the possibilities and situations
Canada	Morning report Grand Round Review of texts Journal club Main speeches Clinical cases conference Skills conferences (procedure) Talk about technology Diagnostic workshops (ECG) simulation Mortality conference (Mortality & morbidity) Browse the board (Board review)
European Union	Not listed separately.
Australia	It is not exactly mentioned in the curriculum but emphasizes clinical experience and exposure to the appropriate composition and number of patients.
Saudi Arabia	Based on the text of the curriculum, the following can be extracted : Clinical experience on patients Training in small groups Virtual teaching Using simulators Technology review sessions Emphasis on distance education for people working in remote areas
Iran	Clinical education, educational round Training sessions: Journal club, magazine review, death conference, book review, ECG review Evidence-based lectures Simulation workshops (for skills)
IFEM	Clinical training in the form of on-site training and educational round Training in small groups, including workshops Education in large groups including conferences, journal club, mortality conferences Virtual training and simulation in the clinical skills training center

IFEM: International Federation for Emergency Medicine.

Table 8: Conditions and manner of student admission (entry conditions) in the studied curriculum

Country	Terms and conditions of student admission
USA	Physicians licensed to work in the United States under U.S. law can apply for the course, and the manager of each residency program will select residents.
Canada	[Same as America]
European Union	It is done according to the laws of the European Union as well as the national laws of each country.
Australia	It is done according to the laws of Australia. Physicians who are members of the Australian Medical System can apply for a specialization course after completing a one-year introductory course in emergency medicine and apply to qualified universities. Each university will accept a resident according to its own instructions.
Saudi Arabia	The candidate after completing the internship and passing the exam (Saudi license exam) can register in the program. People are selected with the opinion of the residency program manager.
Iran	Residents are selected by taking the National residency Admission exam.
IFEM	Being selected by the opinion of the residency program manager.

IFEM: International Federation for Emergency Medicine.

Table 9: Student assessment in the studied curriculum

Country	Student evaluation
America	Student evaluations are done as outcome-based. A specific level has been defined for 17 main competencies for each category (in each year). The program manager evaluates the resident in different ways and if they reach this level of capability, the resident can be promoted to a higher year. Otherwise, they must acquire that level of capability (milestone project).
Canada	Evaluation methods are not discussed separately, but universities have a wide variety of programs for evaluating residents' clinical knowledge and skills.
European Union	Residents should have a portfolio of all their theoretical and clinical activities, and skills. Assessment formative: In workplace ► See how patients are cared for ► Observing practical activities (procedure) Live or video (DOPS) ► Mini Clinical Examination - To check clinical knowledge and skills in doing the procedure as well as their attitudes and how they deal with patients ► Case-Based Discussion, to check clinical reasoning Outside the workplace ► Including patient presentation, case review, research project, etc. Assessment Summative: ► Periodic written exam ► OSCE ► Check the portfolio
Australia	On-the-job evaluation Written test Clinical trial (OSCE) Thesis
Saudi Arabia	Annual upgrade exam Midterm exam Daily evaluation Evaluation of clinical skills Master evaluation Assessment of residents by each other
Iran	Faculty members should regularly evaluate the residents under their supervision. In addition, the residency program must demonstrate that it has an effective mechanism for evaluating the performance of residents throughout the residency period and using the results of this evaluation to improve their performance. The potential use of methods that help inpatient care, theoretical knowledge, communication skills, and professional action should be carefully evaluated. The following tools are recommended: Written exams Station tests) OSCE) PMP Test DOPS Test Key feature problem Chart-stimulated recall method 360 degrees Logbook review Periodic evaluations by faculty members (global rating) B: Frequency of evaluation: (Periods of Assessment) Developmental evaluation: Should be continuous and periodical and are performed formally at least every three months. Final evaluation (compression): Residents' promotion exam is held annually. Certificate and encyclopedia exam at the end of the three-year course
IFEM	Suggested methods Chart-stimulated recall oral examination Global rating of performance Objective Structured Clinical Examination (OSCE) Procedure or case logs Portfolios Record review Simulations and models Oral examination Standardized patient (SP) examination Clinical patient examination skills Written examination

DOPS: Direct observation of procedural skills; OSCE: Objective Structured Clinical Examination; IFEM: International Federation for Emergency Medicine.

Table 10: The length of the specialized course of emergency medicine in the studied curriculum

Country	Course length
USA	In most universities, the course is 4 years, but in some centers, the course is 3 years, which is also approved by ACEP.
Canada	5 years Or family medicine specialty + 1 year
European Union	According to the written curriculum, a period of at least 5 years is suggested. In some countries, emergency medicine is a subspecialty. In some countries, the minimum period is 6-7 years.
Australia	Basic training: At least 12 months Advanced training: 48 months
Saudi Arabia	4 years
Iran	It is currently 3 years and, in the future, the course will be 4 years.
IFEM	4 years

ACEP: American College of Emergency Physicians; IFEM: International Federation for Emergency Medicine.

Table 11: Number and manner of emergency medicine rotations in the studied curriculum

Country	Number and mode of rotation
USA	American College of Emergency Physicians (ACEP) concerning rotations: Each university has made changes to the program according to its circumstances Emergency department: At least 50% of the course should be in the emergency department Anesthesia and intensive care: 2 months Surgery and gynecology: There is no specific time. Capabilities should be as expected. Internal Medicine and Psychiatry: No specific time is provided. Capabilities should be as expected. Pediatrics: 4 months or at least 16% emergency work experience Prehospital and crisis: Required but no specific time is defined. Thesis: Required but no specific time.
Canada	The Canadian Association of Emergency Physicians (CAEP) On the rotation of each of the universities, changes to the program have been made according to their circumstances. Emergency department: 24 months Anesthesia and intensive care: 6 months Surgical and internal medicine: 8 months, of which at least 1 month is psychiatry. Pediatric: 4 months in the pediatric emergency department, of which 2 months should be undertaken as a senior resident. Prehospital and crisis: 1 month Optional: 12months Thesis: prepare a project that is feasible for peer review. For the postgraduate course of family doctor: 6 months emergency and anesthesia, 1-month intensive care, 2 months pediatric, 2 months elective
European Union	There is no specific timeline in the EU curriculum. It is only suggested that the course be at least 5 years and 3 years of it be in the emergency room. Here are the rotations related to England. Emergency department: 3 years Anesthesia and intensive care: 6 months mandatory and 6 months optional. Surgical and internal specialties: At least 3 months, the continuation of which is decided depending on the portfolio of each resident and the need for acquiring skills. Pediatric: 6 months; Resident in Pediatric Emergency Department as a third-year residency. Prehospital and Crisis: Not mandatory but a crisis management course must be taken. Optional: Not required but can be done off-schedule. Thesis: Recommended to do an original article. Performing a review project in a clinical assignment is required for the graduation exam.
Australia	Australasian College for Emergency Medicine (ACEM) On the rotation of each of the universities, changes to the program have been made according to their circumstances. Emergency department: At least 6 months in conditional education, 30 months in advanced education, at least 12 months in adult emergency. Anesthesia and intensive care: In the form of advanced emergency medicine course, minimum 6 months, and maximum 12 months Surgery and gynecology specialties: Maximum 6 months Internal and psychiatric specialties: Maximum 6 months Pediatrics: In the advanced period, at least 6 months in the pediatric emergency department Prehospital and crisis: Maximum 6 months Elective: a 6-month probationary period in elective or emergency departments. In the advanced course, 18 months in approved sections Thesis: A project must be done during the study period.
Saudi Arabia	Emergency department: Adults (23 months), pediatric emergency department (7 months) Anesthesia: 2 months Intensive care: Adults (2 months), Pediatrics (2 months) General Surgery / Trauma: 1 month Plastic surgery: 1 month Gynecology: 1 month Orthopedics: 1 month Internal medicine: 1 month Cardiology: 1 month Neurology: 1 month Hajj: 1 month Prehospital and crisis: 1 month Optional: 3 months Thesis: Required
Iran	Residents in the emergency department must be present for at least 19 months. mandatory rotations First-year Internal medicine: 1 month Anesthesia: 2 months Pediatric: 1 month Cardiology: 1 month General surgery: 1 month Emergency department: 6 months Second-year Obstetrics: 1 month Toxicology: 2 months Orthopedics: 2 months Radiology and ultrasound: 1 month Ophthalmology: 15 days ENT: 15 days Emergency department: 5 months Third-year Pediatric intensive care (Critical Care): 1 month Adult intensive care (Critical Care): 1 month Pre-hospital emergencies: 1 month Elective section: 2 months Emergency department: 7 months Selected Parts and maximum time are as follows: Internal (1 month), general surgery (1 month), infants (1 month), psychiatry (1 month), ophthalmology (1 month), ear, nose, and throat (1 month), neurology (1 month) The thesis is mandatory (no specific time)
IFEM	The number and selection of rotations are left to the residency program manager.