

SPECIAL COMMUNICATION

The journey of emergency medicine in the Arabian Gulf States

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ABSTRACT

In the Arabian Gulf States (AGS), emergency medicine (EM) is well recognized and established as a specialty and has achieved many advancements in different areas, and in particular the emergency medical services. Board certified EM physicians from both international and national programs are leading the specialty development and progress, with national residency training programs in EM filling the shortage of physicians in the field. Although at a national level the EM organizations, conferences, and journals are available to support the specialty, research in EM is still lagging behind and needs major progression. There is still a big potential for improving the specialty, and many challenges and barriers to overcome. The article is a brief journey on the EM specialty in the AGS, and it reflects the status of EM in this rapidly growing part of the world.

Keywords: Emergency medicine, emergency medical services, Arabian Gulf States, residency training programs, disaster medicine, mass gatherings, research.

Author contribution:

- FA substantively conceived, designed, and led the review process, in addition to being the main author of the manuscript. AB, AS, MF, LA, and AA substantively added to the draft the manuscript. LB, SJ, and SH critically revised the manuscript for intellectual content.
- All authors have read and approved the final manuscript.

Background

The Arabian Gulf States (AGS) or the Gulf Cooperation Council countries were formed on 25th May 1981, and consist of six-nation members; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). All these nations share similar religion, language, culture, and political systems [1]. The AGS inhabit the entire Arabian Peninsula if Yemen is excluded (Figure 1). The countries occupy a total land area of 2,410,710 km², with Saudi Arabia accounting for about 83% of land [2]. The total population exceeds 53 million of which nearly 60% are living in Saudi Arabia, but Bahrain has the highest population density of 1,848/km² [2]. Foreign nationals constitute about 59% of the total AGS population [3], in which multiple industries including the healthcare sectors depends on. Table 1 highlights the

variation in population and land size among the AGS with its gross domestic product (GDP) figures.

The AGS used their rich oil and gas revenues to establish healthcare facilities during the 1970s, and the concept of western management corporations were used in Saudi Arabia, UAE, and Qatar to run the major hospitals [5]. Since then, a large number of medical cities, hospitals, and clinics have been established in both the governmental and private sectors to cope with the increased size and aging of the population and to meet the medical services provided to common existing diseases [6]. To continue this mission, the AGS kept their GDP around 4.6%, a figure that is still low when compared to developed countries such as the United States (US), Germany, and the United Kingdom (UK) with GDP expenditures of 16.8%, 11.2%, and 9.9%, respectively [4].

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Received: 12 August 2021 | **Accepted:** 23 August 2021



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Figure 1. The map for AGS (Source: <https://www.mapsofworld.com>).

Unfortunately, the AGS have high prevalence rates for diabetes mellitus [7], obesity [8], and motor-vehicles injury death rates in comparison to global rates [9]. All of these conditions have increased the disease burden on healthcare systems including emergency physicians (EPs) and emergency departments (EDs). Several important statistics on health services and indicators in the AGS are shown in Table 2.

Development of emergency medicine (EM) and its value

Although EM started to evolve in the 60s and 70s, the earliest recognition of the specialty had been in the US in 1973, and then followed by Canada, Australia, Hong Kong, Singapore, and the UK in the 80s. Since then, these countries have been considered pioneers in EM and share similar milestones for the development of the specialty [10]. The specialty has now evolved as a global discipline in every continent [11], and the number

of countries that recognized EM as a primary specialty reached 82 countries in 2019 [12].

EM staff is characterized by its exceptionally wide medical knowledge and competencies. According to the Canadian Association of EM, EM is defined as “a field of medical practice comprised a unique set of competencies required for the timely evaluation, diagnosis, treatment and disposition of all patients with injury, illness and/or behavioral disorders requiring expeditious care, 24/7/365 [13].”

This fast spread of one of the youngest specialties was due to its recognized values and its importance in taking on multiple roles [11,14-16]. Holliman et al. [17] in his literature review demonstrated the value and usefulness of EM in multiple fields which are related to EM specifically and to the healthcare system in general. The demand for seeking emergency health care turned to be multifactorial and includes individual needs and perceptions in addition

Table 1. Population, land, and GDP of the AGS.

Country	Population [2]	Area [2]	Population density [2]	GDP [2]	GDP expenditure on healthcare (%) [4]
Bahrain	1.42 million	770 km ²	1,848/km ²	31.13 billion US dollars	5.2
Kuwait	4.1 million	17,820 km ²	227/km ²	114 billion US dollars	4
Oman	4.425 million	309,500 km ²	14.3/km ²	66.3 billion US dollars	3.8
Qatar	2.6 million	11,600 km ²	206.8/km ²	152.5 billion US dollars	3.1
Saudi Arabia	31.6 million	2,000,000 km ²	15/km ²	646.7 billion US dollars	5.8
UAE	9.1 million	71,020 km ²	110/km ²	348.4 billion US dollars	3.6
Total or average	53.245 million	2,410,710 km ²	22.1/km ²	1,359.03 billion US dollars	4.6

Table 2. The health services, medical staff, and several health indicators in the AGS.

Country	Hospital number [4]	Bed number [4]	Physicians per 1,000 population [4]	Nurses per 1,000 population [4]	Life expectancy at birth (years) [4]	Mortality rate due non-communicable diseases per 100,000 [4]	Diabetes prevalence (%) [7]	Obesity prevalence (%) [8]	Transport injury death rates per 100,000 [9]
Bahrain	25	2,594	3	5.1	76.9	544	17.5	26 (male) 37 (female)	15.74
Kuwait	33	8,317	3.1	6.7	74.7	663	17.9	33 (male) 46 (female)	18.83
Oman	74	6,589	2.7	5.1	77.1	463	8.2	23 (male) 34 (female)	51.45
Qatar	14	2,623	2.9	5.2	78.5	447	16.3	33 (male) 43 (female)	33.38
Saudi Arabia	470	70,844	2.8	5.6	74.6	558	20.5	31 (male) 42 (female)	37.50
UAE	126	12,540	2.7	4.8	77.5	498	10.7	28 (male) 41 (female)	53.71

to other societal factors, all of which have been adapted and revised in the health utilization framework [18].

The ED has not only become the gateway to hospital admission, but also an essential component for the emergency health care and the stage where assessment, stabilization, diagnosis, treatment, risk stratification, and disposition are carried out [11,19-21]. Even the ED design has evolved over the years focusing on the caregiver input and needs to provide functional, well-organized, and safe departments, and which may include additional sections (trauma bay, pediatric, fast track, chest pain, observation, and psychiatry) equipped with advanced modalities [22].

Nowadays, EPs are working in various medical institutions that include different practice models [19]. In fact, EM breached its ED borders and many EPs are now involved in the development of policies and guidelines, healthcare promotion and injury prevention, emergency medical services (EMS) and disaster management, education and research, and becoming administrative leaders in different disciplines [13].

Emergency medicine in the AGS

Prior to the year 2000, most hospitals in the region had EDs that were staffed with general practitioners from various backgrounds who had no EM board-certification

[23-26], a status that is similar to the early days of EM in North America [27-29]. Some of the major tertiary hospitals had recruited western qualified EPs to provide emergency care and to help structure the ED in their respective institutions [24,26,30]. At the same time, many scholarships were offered to local physicians to be trained in EM abroad particular in Canada and the US, and when those returned back home as EM board-certified physicians, they became the seeds to implement and develop EM in their countries through restructuring EDs and establishing national EM residency programs [23-26,31]. Later, these programs became the corner stone to produce qualified EPs that meet the demand for the rapidly growing and evolving specialty in the region. In 1999, Oman was the first AGS to recognize EM as an independent specialty, and other countries followed it soon as shown in Table 6 [12]. Despite the advancement in EM, the EDs status in the region can range from departments that are staffed with board certified EPs and fully equipped with EM focused policies such as those in the tertiary centers and medical cities, to departments that are still lacking appropriate staffing and equipment, which was mainly related to budget issues. Likewise, the majority of rural EDs are still staffed with non-EPs and missing the appropriate transfer procedures to advanced medical centers if needed. As we proceed, the article will elaborate in more details on the different areas related to EM specialty in the region.

Emergency medical services

In the last 20 years, the EMS in AGS has benefited and transformed into an advanced modern system under the umbrella of the EM specialty setup and development. Another factor that helped in advancing the EMS is the large burden of acute disease and trauma, and especially the significantly high rates of motor vehicle accidents fatality in the region [32]. The EMS systems in many AGS had converted from Hospital-Based or Jurisdiction-Directed Systems into complex EMS systems as described by VanRooyen et al. [33], and became national EMS agencies which fall either under the Ministry of Health, Ministry of Interior (Civil Defense Directorate) or an independent governmental agency. In the region, the EMS are centralized, government-funded, free of charge, follow the Anglo-American model, with incorporated Helicopter EMS (HEMS) in its system, and can be requested by calling a free emergency number which varies from country to country [24,34-39] as shown in Table 3.

The EMS staff providing the pre-hospital care are either paramedics, ambulance nurses, or Emergency Medical Technician, and they must be licensed with a valid license, have basic life support, pediatric advanced life support, advanced cardiac life support, pre-hospital trauma life support or equivalent [24,34,39], and follow written clinical protocols. The majority of the staff are non-citizens, and to meet the demand for staffing the EMS, the paramedic's schools/colleges were established in Oman, Qatar, Saudi Arabia, and UAE [34,40-42]. In Qatar, the Hamad Medical Corporation Ambulance Service (HMCAS) was accredited by the Joint Commission International three consecutive times in 2011, 2014, and 2017 [43].

Emergency medicine residency training programs (RTP)

Reviewing the first EMRTP, which goes back to 1970 at the University of Cincinnati with a 2 years-curriculum [44], the AGS took a long time to establish their own. Investing in RTPs is crucial as it had been shown that board-certified EPs with residency training are more efficient, deliver better quality of care [45], and have less malpractice cases [29,45].

In 1999, all the AGS adopted the 4-years RTP which is accredited by the Arab Board of Health Specialization Council, and at the end all candidates must pass an exit certification exam to get the Arab Board of EM (Arab-BEM) [46], a program that is based on the American Board of EM curriculum [24]. The fact that the Arab-BEM lacked standardization and supervision, in addition to the increased demand on the specialty in the region, led individual AGS to develop their own RTPs in EM as shown in Table 4, and in some countries their RTP had replaced the Arab-BEM.

The largest among the AGS is the Saudi Board of EM (SBEM) that has been established in 2005 and accredited by the Saudi Commission for Health Specialties (SCHS) [26]. It is a 4-year well-structured curriculum program, which follows the North American module [47], with 21 recognized and accredited training centers in Saudi Arabia and Bahrain [48]. Due to its small population and the significant resources needed, Bahrain did not construct its own RTP and instead decided to join the SBEM [25]. Oman established its RTP in 1999 as a 6-year program and then converted to 5-year [23]. In 2007, UAE started its first EMRTP in Dubai, then the following year two other programs were started in Abu Dhabi, and similarly it resembled the North American 4-year training curriculum [24]. Kuwait developed a 5-year RTP with supervision and accreditation from the Kuwait Institute for Medical Specializations [49]. Qatar is adapting the Arab-BEM curriculum for their RTP and used the Accreditation Council for Graduate Medical Education-International (ACGME-I) to strengthen it [50]; it recently announced its new Qatari RTP including EM [51]. To enhance its training and seek international recognition, the accreditation bodies in Oman, Qatar, and UAE succeeded to achieve the accreditation from ACGME-I [52].

Registration, licensing, and sub-specialization

Registration and licensing are mandatory in all AGS [53-61]. Although this service is provided sometimes by different authorities within the same country, physicians are required to be licensed to practice and hold a valid license. After completion of the residency training program, EPs are registered and licensed by different authorities as per Table 4.

Table 3. EMS characteristics in the AGS.

Country	National agency providing EMS	Governmental body	Establishment year	Emergency number	Tier system
Bahrain	National Ambulance	Ministry of Interior	2019	999	Single
Kuwait	EMS Directorate	Ministry of Health	1988	112	Two
Oman	National Ambulance Service "Isa'af"	Oman Royal police and Ministry of Health	2004	9999	Single
Qatar	HMCAS	Hamad Medical Corporation	2008	999	Two
Saudi Arabia	Saudi Red Crescent	Saudi Red Crescent Authority	1963	997	Two
UAE	The Centre of Ambulance Services (Dubai) National Ambulance (Abu Dhabi)	Police Department (Dubai) National Ambulance Company (Abu Dhabi)	2006 2010	999 998	Two Two

Table 4. EMRTP, registration and licensing authorities, and subspecialty.

Country	RTP - duration in years	Registration authority	Licensing authority	Subspecialty
Bahrain	Arab Board - 4 Saudi Board - 4	National Health Regulatory Authority	National Health Regulatory Authority	Currently no local subspecialty fellowships in EM Overseas government-sponsored scholarship
Kuwait	Kuwaiti Board - 5	Kuwait Institute for Medical Specializations	Ministry of Health	Currently no local subspecialty fellowships in EM Overseas government-sponsored scholarship
Oman	Omani Board - 5	Ministry of Health	Ministry of Health	Currently no local subspecialty fellowships in EM Overseas government-sponsored scholarship
Qatar	Arab Board - 4 Qatari Board - 4	Qatar Council for Health Practitioners	Qatar Council for Health Practitioners	Currently no local subspecialty fellowships in EM Overseas government-sponsored scholarship
Saudi Arabia	Arab Board - 4 Saudi Board - 4	SCHS	Ministry of Health	Pediatric EM, EMS and Disaster Management, Ultrasound Overseas government-sponsored scholarship
UAE	Arab Board - 4	-Dubai Health Authority (DHA) for Dubai -Health Authority Abu Dhabi for Abu Dhabi and Al Ain -Ministry of Health for all other Emirates -Harvard International for the Dubai Health Care City (DHCC) Authority	-DHA for Dubai -Department of Health-Ministry of Health -Ministry of Health for all other Emirates -Harvard International for the DHCC	Currently no local subspecialty fellowships in EM Overseas government-sponsored scholarship

EM practice depends on the wide scope of expertise EPs have to deal with the undifferentiated conditions seen in the ED. Like any other recognized specialty, there is a move for sub-specialization of EPs, and the EM scope expanded within and outside the ED to include many accredited and non-accredited sub-specialties [29]. The General Medical Council in the UK approved dual training in pediatric EM and pre-hospital EM [62]. In the US, sub-specialization in EM has been recognized since 1991 for pediatric EM followed by sports medicine and toxicology in 1992, with the latest being pain management in 2014 [62]. The Royal College of Physicians and Surgeons of Canada currently recognized Pediatric EM, sports medicine, toxicology, and EMS as sub-specialties [63]. The Australian Medical Council currently recognizes critical care, pre-hospital EM, hospital and palliative medicine, Internal Medicine, Toxicology, pediatric EM, sports medicine, and undersea and hyperbaric medicine [64]. There is a great debate on whether there is a need for a sub-specialization in EM. On the one hand, it has been argued that having an expert in a specified field should improve other EPs' skills in that area [65]. Similarly, it is seen as a high priority and necessary for the development of the specialty [66]. On the other hand, those who argue against sub-specialization in EM view the matter as a threat to the wide scope EM practice needs, and they draw examples from medical and surgical sub-specialization which lead to a shortage in internists and general surgeons [63].

On the AGS level, three sub-specialization fellowship programs are available in Saudi Arabia: pediatric EM, EMS and Disaster Management, and ultrasound [26]. No sub-specialty fellowships are available in other AGS and

there is a heavy dependence on overseas government-sponsored scholarships.

Disaster medicine (DM)

The rising number of disasters facilitate the emergence of DM as a specialty which combines multiple disciplines including: EM, public health, acute care services, EMS, humanitarian agencies, and non-medical services, to deliver care for the victims of natural and man-made disasters as early as possible with the available resources [67]. EPs take the leadership in disaster management and play an integral role in all of its phases [19,68], where the American Board of Physician Specialties established a board certification fellowship in DM titled the 'American Board of DM' [67]. The American College of EPs (ACEP) considers DM as a subspecialty of EM, and support EPs who are interested to study and practice DM [69].

In the AGS, the most common natural and human-made disasters are floods, sandstorms, cyclones, landslides, industrial hazards, and terrorist attacks [70]. Disaster management supervision and activation in the AGS are usually under a governmental authority/committee, which includes representatives from different ministries and agencies [24,25,34,71-73] as shown in Table 5. The hospitals' disaster preparedness and management showed marked advancement in the AGS [70], where EPs and EMS personnel exert more influential roles as leaders in these institutions.

In an effort to respond to regional disasters, the AGS Emergency Management Center was established in 2013 in Kuwait. The center aims to develop and coordinate efforts among the AGS in the emergency and crisis management [25,71].

Mass gatherings (MGs) and Hajj mission

In the literature, a MGs had been defined as an event that is attended by more than 25,000 people and some include a lower figure of more than a 1,000 people, which needs formal essential pre-preparation and resources [74]. ACEP categorized MGs as an event medicine and as a subspecialty of EM, and support EPs who are interested in this field [75].

In recent years, there is an increasing number of MG occasions being held in the AGS. Hajj or pilgrimage to Mecca in Saudi Arabia is the largest MG in the world with an average of 2 to 3 million Muslims attending every year [76]. Hajj is characterized by its high-density population, multinational and large elderly proportion, hot climate, and high coverage capacity from multiple healthcare facilities [77]. This causes a high incidence of respiratory infections, food/water/blood borne diseases, gastrointestinal illness, heat-illnesses, musculoskeletal injuries, accidental burns, acute cardiovascular diseases, and dehydration [76,77]. EPs and EMS personnel play a major role in covering the event every year, with extensive resources being used that include ground and air ambulance units, mobile medical teams and tents, and preparing dedicated hospital to receive the patients [36,78]. As Hajj shown to be an event full of dynamic activities with a wide range of urgent and emergent medical conditions, the SBEM introduced a mandatory 4-weeks Hajj rotation into the curriculum for senior postgraduate year 3 and 4 residents [26,76]. Finally, Saudi Arabia conducted four international conferences on MGs medicine in an effort to increase knowledge and research, address issues, collaborate and coordinate activities on a global level [79].

Research

Emergency care research may be defined as research that focuses on the discovery and application of time-critical diagnostics, decision making and treatments that save lives, prevent, or reduce disability, and restore human health [80,81]. There is no universally accepted standardized method or tool for measuring research productivity, and common metrics include the number of publications, especially in peer-reviewed journals with a high impact factor; new metrics like Altmetric scores and *H*-index have been developed to measure the academic impact and productivity of a scientist [82,83].

A review of global EM literature found that the Middle East was one of the regions that produced the lowest proportion of research; in the latest review of global EM literature in 2018, no research articles from the AGS were listed [84,85]. A study done in Saudi Arabia shows an average of 4.7 publications per year in EM [86]. A number of review articles have been written on the state of EM from different AGS; however, none of the articles mentioned or recognized the importance of research in the field, implying that very little research is being carried out or emergency research care is still not a priority in this field in the region [23-26].

The research at the residency level has started but is still in its infancy. In Oman, only two research articles were published by EM residents between 2011 and 2016 [87].

Similarly, a study in the UAE found that research proposals submitted in a period of over 7 years in EM had one of the lowest numbers of research proposals, and research is not mandatory in the Arab-BEM and SBEM programs [88]. The path for EM research in the region needs to be paved by overcoming the many hurdles faced by residents and EPs. These are previously described in the literature and include: creating an interest in research, securing research time for physicians and faculty, allocating mentors, building the research skills with a dedicated curriculum, and finally securing research funding [89].

A number of initiatives have been taken in the right direction; countries like Saudi Arabia and the UAE have invested in research and are sending board certified EPs to North America for training in advanced research. Dubai had established a residency research program in 2011 to encourage research among junior physicians [88], and research is made mandatory in the Omani RTP [23]. Having peer-reviewed journals for pure emergency research like the *Journal of EM, Trauma and Acute Care* and the *Saudi Journal of EM* is another great step in promoting EM research in the region [90,91]. Finally, the region shares common cultural values and even the types of disease burden and disorders which are common and unique to this area, the establishment of an EM research network in the AGS might smooth the way for more productive clinical practice and changing research in the area.

Professional/academic associations

All professions need to be represented in a professional association that strives to advance their interests and needs. These associations tend to take on several roles which include setting clinical guidelines, provision of continuing medical activities including conferences [92], provide access to a broader network of professionals and experts, and public health education [93]. Every single AGS has its own EM association/society that was established at different timelines (Table 6), and is usually a branch of the country's general Medical Association. Qatar founded the first EM association in the gulf region, "The Pan Arab Society of Trauma and EM," in 2002 [10]. These organizations mainly play major educational and social roles by utilizing web sites, newsletters, conferences, and workshops to advocate and promote on behalf of the EPs and the specialty, and offer a broad professional network. In 2006, the Bahrain Association of EM attained the full membership of the International Federation for EM (IFEM) [94].

In 2014, during the EM conference hosted by Emirates Society of EM (ESEM), the idea to launch the Gulf Federation of EM (GFEM) was discussed in efforts to coordinate, collaborate, and enhance the specialty in the region. The GFEM was birthed and became an ex-officio member under the (IFEM) in December 2017 [31].

EM medical journals

In the US, the history of EM journals goes back to 1980, when the *Journal of ACEP* became a peer-reviewed journal and was renamed as *Annals of Emergency Medicine*, then followed by the emergence of two new journals in 1983: *Journal of Emergency Medicine* and

Table 5. The Governmental Committee or Authority responsible for disaster management.

Country	Committee	Formation year
Bahrain	National Commission for Disaster Management	2006
Kuwait	Ministry of Health and Ministry of Interior	NA
Oman	National Committee for Civil Defense	1999
Qatar	Supreme Council of Health	2009
Saudi Arabia	General Directorate of Civil Defense	1987
UAE	National Emergency Crisis and Disasters Management Authority	2007

Table 6. AGS EM Association/Society, first conducted conference, and the specialty journals.

Country	Specialty recognition year	National associations - foundation year	First conference	Specialty journal
Bahrain	2004	Bahrain Association of EM - 2004	2019	NA
Kuwait	2011	Kuwait EM Society - 2014	2013	NA
Oman	1999	Oman Society of EM - 2013	2017	NA
Qatar	2000	The Pan Arab Society of Trauma and EM - 2002	2002	Journal of EM, Trauma and Acute care
Saudi Arabia	2001	Saudi Society of EM - 2008	2008	Saudi Journal of EM
UAE	2004	ESEM - 2012	2013	NA

the *American Journal of Emergency Medicine* [44]. In the AGS there are many medical journals, however only two are considered as an EM specialty journals (Table 6). The first, *The Middle Eastern Journal of Emergency Medicine*, was published under the Pan Arab Society of Trauma and EM since 2002 [10]; the journal was later renamed to the *Journal of Emergency Medicine, Trauma and Acute Care* [90]. The second journal is the *Saudi Journal of Emergency Medicine*, which has been recently launched in 2020 [91]. Both are peer-reviewed journals and accept manuscripts for publication from EPs, to promote and boost sharing and spread local and global knowledge in EM [90,91].

Emergency medicine conferences

The professional associations recognize that conferences can benefit physicians by gaining new evidence-based knowledge through the presented topics, research, workshops, obtaining hours for continuing professional development, giving group solidarity for the specialty and an opportunity for networking and socializing [95]. Following its establishment, the Pan Arab Society of Trauma and EM conducted its first EM conference ‘Qatar International Trauma and EM Conference’ in 2002 [10]. Since then, other AGS EM associations started conducting their own EM conferences (Table 6). Both the ESEM and the Saudi Society of EM run their own annual conference regularly since 2014 and 2016 respectively [31,96]. Bahrain Association of EM was the last to join the conference hosting path and held its first conference in October 2019 [97]. Most recently, the city of Dubai won the honor to host the 20th International Conference on EM in 2021 [98].

Challenges

Demands on the EDs globally continue to grow while EPs continue to work under huge pressures,

magnified by the economic demands and the potential to negatively affect the quality of care that ED patients receive. Worldwide, those challenges are the same with different intensity levels based on the level of care the hospitals provide and population density they cover. The ED overcrowding is a common phenomenon in the region, and in particular it is a challenge in Saudi Arabia [26], where some AGS are confronted with a shortage of qualified EPs and nurses [23-25,35]. Multiple studies have shown that burnout and stress is becoming a growing concern for both the EPs [99,100] and the emergency residents in their RTPs [101-104]. There are variances in the established RTPs development in terms of duration, curriculum, supervision, accreditation, research, and limited sub-specialty fellowship training. The increased number of new graduates from various RTPs in the region is filling the shortage gap, but it must be monitored over the next few years to avoid the oversupplying of EPs, a status similar to Australia [105] and the US [106].

The EMS agencies had achieved great advancements in the services they provide, but a systematic review had revealed the need for more studies to evaluate the quality of services provided in terms of key performance indicators, and in particular for Bahrain and Kuwait [107]. Because the service is free, in some AGS, the service is being overwhelmed by low-acuity cases, and on the other hand, the ambulance utilization rate for high-acuity cases is low. For example, the third gulf registry of acute coronary events (Gulf RACE-3Ps) showed that ambulance use by patients presenting with ST-elevation myocardial infarction is about 26% [108]. This can be changed with public education and establishment of national policies. All the EMS agencies have HEMS, but it is been under-utilized especially in some bigger AGS, and this costly service should be used more often for far critical cases in rural areas and remote islands.

The rural EM especially in the large AGS (e.g., Oman, Saudi Arabia, and UAE) is still in its early stages and needs to be given more consideration. The US experience, challenges, and strategies to advance the rural EM provides us with lessons which we can learn from [109].

Finally, the research focusing on EM and its related sub-specialties is still far behind, and most of the mentioned issues are not well studied primarily due to poor research status in the AGS and established and standardized methods of data collection and reporting. Research must be mandatory in all the RTPs, with providing all the support needed for the devoted EPs in research with protected time, resources, and finding.

Conclusion

Over the last two decades, EM as a medical specialty in the AGS reached a mature stage and is continuing to evolve and advance. The specialty had passed the stage of struggling to be recognized, and became an essential part in the healthcare system through its valued provision of emergency care. This is evident by the formation of RTPs in EM which resulted in increasing the number of qualified EPs, and establishing regulations, national EM organizations, conferences, and journals to support the specialty. The EMS is operated through well-supported agencies working closely with the EDs, and is involved in the disaster preparedness plans. However, more efforts must be injected at different levels to deal with the challenges the specialty is facing, and to seek more coordination, collaboration, and partnership with the AGS at the governmental, EPs, and EM societies' levels.

List of Abbreviations

AGS	Arabian Gulf States
ABEM	Arab Board of EM
ACGME	Accreditation Council for Graduate Medical Education
ACEP	American College of EPs
DM	Disaster Medicine
ED	Emergency Departments
EM	Emergency Medicine
EMS	Emergency Medical Services
EP	emergency physicians
ESEM	Emirates Society of EM
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GFEM	Gulf Federation of EM
Gulf RACE-3Ps	Gulf registry of acute coronary events
HEMS	Helicopter EMS
IFEM	International Federation for EM
NCD	Non-communicable diseases
RTP	Residency Training Programs
SBEM	Saudi Board of EM
SCHS	Saudi Commission for Health Specialties
UAE	United Arab Emirates

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

No funding.

Consent to participate

Not applicable.

Ethics approval

Not applicable.

Availability of data and materials

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study. The data provided in the manuscript is available publicly.

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