

Evolution of emergency medical services in Saudi Arabia

Abdullah Bunayyan AlDawsari^{1*}, Nasser Bunayyan AlDawsari²

¹*Corresponding Author, Paramedic Specialist .King Fahad Medical City, Riyadh .KSA

²Technician-Emergency Medical Service, King Salman Hospital, Riyadh .KSA

DOI: <https://doi.org/10.5281/zenodo.7350992>

Published Date: 23-November-2022

Abstract: Aim: the aim of this study was to supply an summary of the evolution of emergency medical services (EMS) in Saudi Arabia to explain its history, organizational service providers, governance, EMS statistics and also the academic development of the sphere with the inequality of educational approaches. The EMS in Saudi Arabia has seen variety of positive changes over the past decade, a number of that embody the event of many university and faculty programs dedicated to teaching EMS, the analysis of the profession from a post-employment care model into a pre-employment bachelor's degree model, the generous governmental scholarship grants overseas and also the official enfranchisement of EMS as a profession. it's been close to 9 years since the primary EMS bachelor's degree programs were developed in Saudi Arabia, a number of that were directly adopted from universities in developed countries admire Australia. This paper describes the history of EMS in Saudi Arabia with a selected specialize in distinguishing the inequality within the academic outcomes and approaches adopted by schools and universities in the Kingdom. This paper is that the 1st to supply an summary of the EMS service in Saudi Arabia, for institutions and researchers to realize an improved understanding of the history and current standing of the service from an academic and operational perspective.

Keywords: Emergency medical services, paramedics, Saudi Arabia, EMS.

1. INTRODUCTION

The Kingdom of Saudi Arabia (KSA) was established in 1932. At more than 2,150,000 km², it is about a quarter the size of the United States and makes up almost 80% of the Arabian Peninsula.¹ Saudi Arabia is made up of 13 regions, each containing a capital city. Eight countries border Saudi Arabia clockwise from the north: Jordan, Iraq, Kuwait, Bahrain, Qatar, the Emirates, Oman and Yemen.

Saudi Arabia's geography is diverse, with coasts on the Arabian Gulf and the Red Sea, mountains in the southwest, and plains and deserts covering more than half of the country. According to the KSA General Statistics Authority, the estimated population of Saudi Arabia in 2016 was 31,742,580. Health system in terms of the number of health professionals in relation to the population per 10,000 inhabitants, it is 26.5 doctors and dentists, 53.7 nurses, 7.2 pharmacists and 30.8 health professionals including EMS.³ The Department of Health (MOH) budget for 2014 was 59.

985 billion Saudi riyals, which is 7.01% of the total national budget. This does not include the budget for the country's other health sectors, and 43.5% of the Ministry of Health's budget was allocated to staff salaries.⁴ In total, there are 453 hospitals and 67,997 beds, 59 nationwide.

3% of these are operated by the Ministry of Health.⁴ In addition, 29.5% of Saudi Arabia's population is under the age of 15 and life expectancy is 74.2 years, four years more than the world average and six years more than the regional average .⁴

The five leading causes of death are ischemic heart disease (21.7%), stroke (16%), lower respiratory tract infection (6.3%), traffic accidents (5.8%) and diabetes mellitus (4.6%) .³

2. HISTORY OF EMS IN SAUDI ARABIA

The records of EMS in Saudi Arabia is immediately associated with the Saudi Red Crescent Authority (SRCA). The SRCA constitutes the start of pre-clinic care being supplied via way of means of the Saudi authorities for the overall public from the early a long time of the improvement of healthcare in KSA. According to the SRCA legit site, EMS care became simplest formally institutionalized via way of means of an impartial ambulance issuer after the formation of the National Ambulance Health Association (NAHA) in 1353 Hijri (Islamic Calendar) equal to 1934. The position of the ambulance carrier became to begin with a part of the Public Health and Ambulance Authority, which became the governmental issuer of fitness and ambulance take care of the overall public and specifically to the pilgrims travelling Mecca and Medina.⁵ The improvement of the NAHA took place via way of means of the reaction to the Saudi Yemeni War in 1934 via way of means of imparting scientific take care of the military.⁵

Following the Saudi Yemeni War, pre-clinic care became usually constrained to Mecca and Medina and became a charitable and personal initiative below the Charitable Relief Society (CRS).⁵

However, after World War II, the earnings of those personal establishments became significantly diminished, main to dependence at the authorities in place of charity. Eventually, in 1383 Hijri (1963), a royal decree from King Faisal became issued to transform the CRS from a personal right into a public organization below the call Saudi Red Crescent Association.^{5,6} The call became later amended in 2008, to the Saudi Red Crescent Authority.⁷ The principal goals of the SRCA embody imparting useful resource relief, ambulance offerings and appearing humanitarian paintings via worldwide treaties.⁶ The SRCA is the 91st member of the International Federation of Red Cross and Red Crescent Societies.⁶ Furthermore, the workplace of the United Nations High Commissioner for Refugees (UNHCR) became worried in imparting an emergency control schooling program taking part with SRCA in 2000.

3. ORGANISATION AND SERVICE PROVIDERS

The inter-facility affected person switch is normally the obligation of hospitals and now no longer SRCA, with those hospitals strolling their very own ambulance switch provider.^{8,9} The EMS provider in Saudi Arabia is primarily based totally on an Anglo-American version, which objectives for the fast delivery of sufferers to an emergency branch through clinically equipped paramedics.¹⁰ Other nations that undertake this version are the United Kingdom, the United States, New Zealand, Australia and the Sultanate of Oman.¹⁰ The pre-clinic care device in Saudi Arabia remains growing in problems concerning network attention, attitudes and the information deficiencies of pre-clinic care carriers. In a latest observe, AlHabib¹² in comparison the EMS and non-EMS affected person transfers withinside the Arabian Gulf nations for acute care and defined the significance of medical arrival inside 24 hours of the onset of signs of ST phase Elevation Myocardial Infarction (STEMI). The observe determined that out of the 2,928 sufferers transferred, most effective 109 (3.7%) used the Red Crescent EMS provider, which the observe defined as a “annoying finding”.¹²

In addition, the observe pronounced a massive loss of fundamental existence help (BLS) and superior cardiac existence help (ACLS) certifications of the paramedics worried.¹² The majority of affected person ECGs had been additionally completed in hospitals and now no longer through EMS carriers,¹² which can also additionally imply a predicament withinside the contemporary medical and theoretical competence of EMS carriers. In the case of Motor car injuries (MVA), the coincidence scenes frequently contain friends, own circle of relatives participants and spectators, which can also additionally result in massive interruption to on-web website online affected person care.¹³ Furthermore, in a latest Saudi Arabian observe, it became determined that almost all the pre-clinic care carriers suffered from a lack of know-how concerning critical stroke signs. The trouble of moving sufferers without delay to hospitals in non-public automobiles through own circle of relatives participants or strangers worried in injuries may be related to many factors, which consist of socioeconomic, schooling, public attention or media.^{12,13} However, a idea which can additionally have an impact is the Arab subculture of ‘Fazaa’, which may be defined as supporting the ones in want and is taken into consideration a virtue. The observe through Alsalloum¹⁵ contributed to the improvement of a version for SRCA to pinpoint the maximum suitable places for EMS stations, with the intention of decreasing morbidity and mortality withinside the Riyadh populace through enhancing reaction time.¹⁵

Another plan, with the intention of substantially lowering morbidity and mortality of sufferers with trauma in Saudi Arabia, became proposed through Al-Naami.¹⁶ The plan requires establishing Other organizational problems dealing with EMS in Saudi and mainly SRCA is the shortage of courses concerning key overall performance indicators, consisting of the reaction

time for pre-clinic cases. However, some other observational cross-sectional observe regarding 1534 persons, 355 of whom had preceding revel in of utilizing the offerings of SRCA, pronounced than 40. 3% (n 1/4 143) of the ambulances arrived after 1 hour. ¹⁸ In addition to the respondents of the observe, most effective a 3rd knew the real dispatch quantity for SRCA. ¹⁸ These outcomes recommend a big loss of public attention of the offerings supplied through EMS in Saudi Arabia.

4. STATISTICS

In 2014, SRCA responded to and transported 260,789 cases throughout the Kingdom.4 When comparing this number to other countries in the same year, Ambulance Victoria, Australia, responded to 840,188 cases, inclusive of emergency and non-emergency cases.¹⁹ The population of Saudi Arabia in 2014 was 30,770,375, whereas that of Australia in 2015 was 23,860,100 and specifically the population of Victoria was 5,596,670.20,21 Despite the fact that the population of Saudi Arabia is 5.49 times that of Victoria, their overall utilization of the EMS services is approximately one-third (0.31) of that of Ambulance Victoria.

Table 1. Comparison of population and ambulance response rate of Saudi Arabia with other countries and states.

EMS provider	Number of cases	Country or state population	Per 1000 persons a year
SRCA	260,789	30,770,375	8.47
AV (State of Victoria)	840,188	5,596,670	150.12
Hamad Medical Corporation	168,332	2,003,700	84.01
NHS	9,000,000	54,300,000	165.74

Source: Hamad Medical Corporation, Ambulance Victoria,¹⁹ Australian Bureau of Statistics,²⁰ General Authority for Statistics,²¹ National Health Service England,²² Qatar Ministry of Development Planning and Statistics, Office of National Statistics.

5. GOVERNANCE

The quality and development of an EMS system in any country cannot be measured using a specific classifications scale of the stages of development in EMS, to assess whether the country is developed or underdeveloped. Therefore, it can be helpful to provide a comparison of certain aspects of the current situation between developed countries, such as Australia, the United Kingdom (UK) and the United States of America (USA), and Saudi Arabia, as can be seen in Table 2.

Table 2. Overview of EMS governance in Saudi Arabia compared with other countries.

Country	Registry and licensing	Primary pre-hospital care provider	Industry-based governance	Professional health associations
Australia	Employer based (state based)	State providers	CAA PA	
Saudi Arabia	SCFHS	SRCA	Employer-based	SASEM, SAEMS
United Kingdom	HCPC	Regional trusts	JRCALC	College of Paramedics
United States	NREMT and state-based		NHTSA and state-based	NREMT

Source: Saudi Red Crescent Authority,⁵ Health & Care Professions Council UK,²⁶ Saudi Society of Emergency Medicine, Saudi Commission for Health Specialties, Brooks et al., Whitmore and Furber, Paramedics Australasia,³¹ Council of Ambulance Authorities, National Highway Traffic Safety Administration, National Association of Emergency Medical Technicians.

It should be noted that the health industry employers are required to follow the regulations, registration, licensing and other similar requirements that are set by out by the SCFHS.28 In the United States, the title EMT-paramedic was officially recognized as an allied health occupation in 1975. The EMS specialty has also been recognized professionally by the SCFHS and is categorized within three tiers for university and college graduates: specialist for a bachelor's degree, senior specialist for a master's degree and consultant specialist for a PhD holder (Table 3) with other specific requirements, such as experience and certain short courses.

Table 3. SCFHS specialist tiers and requirements

University degree held	Level of recognition	Required experience
Bachelor’s (4 years degree and 1 year internship)	Specialist 4 years study	1 year internship
Master’s (2 years)	Senior specialist	2 years postgraduate Specialty experience
PhD (4 years)	Consultant specialist	3 years post-PhD Specialty experience

Note: tier upgrade is granted post-experience. For example, a person who graduated with a PhD will be classified as a senior specialist. After completion of the required experience, he/she will be upgraded to a consultant specialist. They are not required to pass through every tier but are granted the tier on the basis of their current qualification.

Source: Saudi Commission for Health Specialties.

This was followed with the establishment of the SAEMS (Saudi Association of Emergency Medical Services), which has similar objectives but is oriented towards EMS.²⁸ Although these associations have no governance over the profession or the practitioners, they may play a future role in developing professional healthcare workers in the field of pre-hospital care. Such a role can be compared to that of the British Paramedic Association, which is now called the College of Paramedics, whose aim is to provide a professional voice for EMS clinicians in legislation, education and the community. These types of associations can also be compared with Paramedics Australasia (PA), which is a professional

6. EDUCATIONAL TRANSITION

- Stage 1: Beginnings: The first aid provider, workplace training 1934 –2005;
- Stage 2: Development: The professional technician, EMS diplomas 2005 –2012;
- Stage 3: Academic transition: The specialist, bachelors in EMS 2007 –present.

During this stage, the concept of a paramedic as a separate health profession did not exist in Saudi Arabia; this is made evident by the founding charter of SRCA 1386 H (1966), which states, in the second part (article 6), that the Saudi Red Crescent will strive to elevate the nursing profession and train both male and female nurses on hospital work and emergency situations.⁵ This was thought to be achieved by training courses and the creation of ambulance and nursing schools.⁵ In the United States, the start of an organized civilian EMS system was initiated in the 1960s, as the operations of the EMS system continued to develop, so did the educational sector.³⁷ In the early 1970s, physicians and registered nurses were the trainers for the majority of EMS educational courses.

7. DISPARITY OF EDUCATIONAL APPROACHES

With the rapid development in the field of pre-hospital care from limited first aid post-employment training courses into recognized university bachelor’s programs, the universities and colleges developed their own expectations, and core competencies, which in the case of KSAU-HS, were based on scientific research.⁹ These disparities are apparent when reviewing the different EMS university and college programs in Saudi Arabia. This is defined by the US department of National Highway Traffic Safety Administration (NHTSA) as “Certification – the issuing of a certificate by a private agency based upon standards adopted by that agency that are based upon competency.”³⁷ Moreover, to be able to define the criteria by which each college or university specifies their goals, expectations and competencies of their students, the definition by the CAA Paramedic Professional Competency Standard will be utilized “the combination of skills, knowledge, attitudes, values and abilities that underpin effective and/or superior performance in a profession/occupational area”⁵⁴. Another definition stated by the NHTSA National Emergency Medical Services Education Standards report is that for “Competency – expected behavior or knowledge to be achieved within a defined area of practice.”³⁷ The method by which the different EMS program competencies were identified was based on these definitions.

8. FUTURE DIRECTIONS

An advanced pathway to remedy the disparity of instructional strategies in Saudi EMS is as follows: 1. To empirically broaden a Saudi-primarily totally based version of competence primarily based totally at the wishes and issues of Saudi Arabia.

2. The technique in growing the center skills version have to be an aggregate of global requirements and nearby Saudi requirements.
3. The manner of improvement have to consist of inputs from academic, scientific and management to symbolize the extraordinary stakeholder groups.
4. A standardization of the Saudi center skills version at Saudi universities and schools that provide the bachelor's diploma of EMS. In conclusion, it might seem that there's a loss of concord withinside the contemporary fame of graduate skills from Saudi schools and universities, as such, it could be prudent to expect this hole through growing a Saudi Arabian precise set of bachelor's stage center competency requirements, which can be extra suitable for the United States of America and replicate the wishes of the Saudi EMS industry.

9. CONCLUSION

The area of EMS in Saudi Arabia has visible sizeable improvements withinside the career at some point of the previous few a long time in lots of aspects, which include organizational and instructional. Nonetheless, there stay significant problems dealing with the carrier providers, along with the shortage of posted material, presentation of modern statistics, the extent of focus of EMS via way of means of the network and the want to enhance the extent of schooling of the pre-health facility practitioners. The instructional improvement of EMS packages in Saudi universities and faculties is significant, but there may be a loss of concord among the expectancies of the graduates from those institutions. Therefore, it's far encouraged that empirical studies ought to be evolved to observe and gift treatments for demanding situations dealing with the development of the EMS career.

Competing interests

The authors declare that they have no competing interests.

REFERENCES

- [1] Ministry of Foreign Affairs. About Saudi Arabia. Available from: <http://www.mofa.gov.sa/sites/mofaen/ServicesAndInformation/aboutKingDom/Pages/KingdomGeography46466.aspx> (accessed 28 April 2016).
- [2] General Authority for Statistics. Population by Age Groups, Gender and Nationality (Saudi/Non-Saudi) 2016. Available from: http://www.stats.gov.sa/sites/default/files/estm_pop_2016_3.pdf (accessed 15 January 2017).
- [3] Global Health Observatory. Saudi Arabia: WHO statistical profile 2015. Available from: <http://www.who.int/gho/countries/sau.pdf?ua=1> (accessed 28 April 2016).
- [4] Ministry of Health SA. Statistical Book 2014. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Documents/Statistics-Book-1434.pdf> (accessed 21 May 2016).
- [5] Saudi Red Crescent Authority. History of SRCA 2013. Available from: <http://www.srca.org.sa/History.aspx> (accessed 6 May 2016).
- [6] United Nations High Commissioner for Refugee. UNHCR Signs agreement with Saudi Red Crescent Society 2007. Available from: <http://www.unhcr.org/46264e9e4.html> (accessed 29 April 2016).
- [7] Albader I. Red Crescent in Gulf countries: International Center for Researches & Studies MEDAD; 2010. Available from: <http://www.medadcenter.com/investigations/284> (accessed 3 February 2017).
- [8] Al-Yousuf M, Akerele T, Al-Mazrou Y. Organization of the Saudi health system. *East Mediterr Health J.* 2002;8(4-5):645-653.
- [9] Alanazi A. Curriculum design of emergency medical services program at the College of Applied Medical Sciences. *Adv Med Educ Pract.* 2012;3:7-18.
- [10] Al-Shaqsi S. Models of international emergency medical service (EMS) systems. *Oman Med J.* 2010;25(4):320-323.
- [11] Salleeh H, Tom M, Ahmed Y, Leggio W, Abdulqader N. Out of hospital pediatric cardiac arrest: prospective study from Riyadh, Saudi Arabia. *Biosci Biotechnol Res Asia.* 2016;13(1):569-572.

- [12] AlHabib K, Sulaiman K, Al Suwaidi J, Almahmeed W, Alsheikh-Ali AA, Amin H, Al Jarallah M, Alfaleh HF, Panduranga P, Hersi A, Kashour T, Al Aseri Z, Ullah A, Altaradi HB, Nur Asfina K, Welsh RC, Yusuf S. Patient and system-related delays of emergency medical services use in acute ST-elevation myocardial infarction: results from the third gulf registry of acute coronary events (Gulf RACE-3Ps). *PLoS ONE*. 2016;11(1):e147385.
- [13] Alanazi A. Emergency medical services in Saudi Arabia: A study on the significance of paramedics and their experiences on barriers as inhibitors of their efficiency. *Int J Appl Basic Med Res*. 2012;2(1):34–37.
- [14] Althubaity E, Yunus F, Al Khathaami A. Assessment of the experience of Saudi emergency medical services personnel with acute stroke. On-scene stroke identification, triaging, and dispatch of acute stroke patients. *Neurosciences (Riyadh)*. 2013;18(1):40–45.
- [15] Alsalloum O, Rand G. Extensions to emergency vehicle location models. *Comput Oper Res*. 2006;33(9):2725–2743.
- [16] Al-Naami M, Arafah M, Al-Ibrahim F. Trauma care systems in Saudi Arabia: an agenda for action. *Ann Saudi Med*. 2010;30:50.
- [17] Al-Ghamdi A. Emergency medical service rescue times in Riyadh. *Accid Anal Prev*. 2002;34(4):499–505.
- [18] Hamam A, Bagis M, AlJohani K, Tashkandi A. Public awareness of the EMS system in Western Saudi Arabia: identifying the weakest link. *Int J Emerg Med*. 2015;8(1):70.
- [19] Ambulance Victoria. Annual Report 2014 –2015. Available from: <https://s3-ap-southeast-2.amazonaws.com/prod-assets.ambulance.vic.gov.au/wp-content/uploads/2016/03/av-annual-report-2014-2015.pdf> (accessed 19 May 2016).
- [20] Australian Bureau of Statistics. Australian Demographic Statistics September quarter 2015. Available from: [http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/286E947B6B8D7E2CCA257F7F001D9807/\\$File/31010_sep%202015.pdf](http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/286E947B6B8D7E2CCA257F7F001D9807/$File/31010_sep%202015.pdf) (accessed 19 May 2016).
- [21] General Authority for Statistics. The total population 2014. Available from: <http://www.stats.gov.sa/ar/indicators/1> (accessed 28 April 2016).
- [22] National Health Service England. Ambulance Services, England 2015. Available from: <http://www.hscic.gov.uk/catalogue/PUB17722/ambu-serv-eng-2014-2015-rep.pdf> (accessed 22 May 2016).